2024

U.S. Biennial Transparency Report

First Biennial Transparency Report of the United States of America

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Abbreviations and Acronyms

AAI	Africa Adaptation Initiative
ACEF	United States-Africa Clean Energy Finance Initiative
AEO	Annual Energy Outlook
AESP	Appliance and Equipment Standards Program
AIM	American Innovation and Manufacturing
ANL	Argonne National Laboratory
ART	Achievable Reduction Tool
ASEAN	Association of Southeast Asian Nations
ATVM	Advanced Technology Vehicle Manufacturing
AVERT	Avoided Emissions and Generation Tool
BAU	Business as Usual
BEA	Bureau of Economic Analysis
BESS	Battery Energy Storage System
BIL	Bipartisan Infrastructure Law
BIPOC	Black, Indigenous, and People of Color
BLM	Bureau of Land Management
BR	Biennial Reports
BRIC	Building Resilient Infrastructure and Communities
BTR	Biennial Transparency Report
Btu	British thermal unit
C	Carbon
CACCI	Comprehensive Action for Climate Change Initiative
CAFE	Corporate Average Fuel Economy
CAP	Climate Adaptation Plan
CAP/RISA	Climate Adaptation Partnership/Regional Integrated Sciences and Assessments
CASC	Climate Adaptation Resilience Center
CCS	Carbon Capture and Sequestration
CCUS	Carbon Capture, Utilization, and Storage
CEIA	Clean Energy Investment Accelerator
CFC	Chlorofluorocarbon
CFLRP	Collaborative Forest Landscape Restoration Program
CFP	Community Forest Program
CGE	Computable General Equilibrium
CH_4	Methane
CIFIA	Carbon Dioxide Transportation Infrastructure Finance and Innovation Act
CIG	Conservation Innovation Grants
CITAP	Coordinated Interagency Transmission Authorizations and Permits
CMA	The first Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CMI	Critical Materials Innovation
CMOP	Coalbed Mining Outreach Program
CMRA	Climate Mapping for Resilience and Adaptation
CO_2	Carbon dioxide
CRAFT	Climate Resilience and Adaptation Finance & Technology
CRP	Conservation Reserve Program
CRT	Common Reporting Tables
CSBG	Community Services Block Grant
CSP	Conservation Stewardship Program
CTA	Conservation Technical Assistance Program

CTCN	Climate Technology Center & Network
CTF	Common Tabular Format
CWPP	Community Wildfire Protection Plan
DFC	Development Finance Corporation
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOT	Department of Transportation
ECPA	Energy Conservation and Production Act
EG	Emissions Guidelines
eGRID	Emissions & Generation Resource Integrated Database
EIA	Energy Information Agency
EIR	Energy Infrastructure Reinvestment Program
EMS	Emergency Management Services
EO	Executive Order
EPA	Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
EQIP	Environmental Quality Incentives Program
ERA	Empowering Rural America
EV	Electric Vehicle
EXIM	Export-Import Bank of the United States
FAA	Federal Aviation Administration
FAO	Food and Agriculture Organization
FARG	Federal Adaptation and Resilience Group
FASOMGHG	Forest and Agriculture Sector Optimization Model with Greenhouse Gases
FDA	Food and Drug Administration
FECM	Fossil Energy and Carbon Management
FEMA	Federal Emergency Management Agency
FEWS NET	Famine Early Warning Systems Network
FFRMS	Federal Flood Risk Management Standard
FLP	Forest Legacy Program
FMC	First Movers Coalition
FSP	Forest Stewardship Program
FTAC	Fast Track Action Committee
FY	Fiscal Year
GAO	Government Accountability Office
GAOA	Great American Outdoors Act
GCAM	Global Change Analysis Model
GCAP	Global Climate Action Partnership
GCCS	Gas Collection and Control Systems
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GHGRP	Greenhouse Gas Reporting Program
GREET	Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation
GRIP	Grid Resilience and Innovation Partnerships
GRRP	Green and Resilient Retrofit Program
GSA	General Services Administration
GW	Gigawatts
GWP	Global Warming Potential
GW	Gigawatts
GWP	Global Warming Potential
HCO	Home Certification Organization
HDV	Heavy Duty Vehicle
HECG	High Energy Cost Grants
HFC	Hydrofluorocarbon

HHS	United States Department of Health and Human Services
HPwES	Home Performance with ENERGY STAR
HUD	United States Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Cooling
IECC	International Energy Conservation Code
IPCAN	Indigenous Peoples' Conservation Advisory Network
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Planning Model
IPO	Indigenous Peoples Organization
IPPU	Industrial Processes and Product Use
IRA	Inflation Reduction Act
IRS	Internal Revenue Service
ITMO	Internationally Transferred Mitigation Outcomes
JETP	Just Energy Transition Partnership
km^2	Square kilometers
kWh	Kilowatt-hours
LCA	Life Cycle Analysis
LCFS	Low Carbon Fuel Standard
LDC	Least Developed Countries
LDV	Light-Duty Vehicle
LFG	Landfill Gas
LGA	Loan Guarantee Agreement
LIFE-AR	Least Developed Countries Initiative for Effective Adaptation and Resilience
LIHEAP	Low Income Home Energy Assistance Program
LMOP	Landfill Methane Outreach Program
LPO	Loan Programs Office
LSR	Landscape Scale Restoration
LULUCF	Land-Use, Land-Use Change, and Forestry
MDB	Multilateral Development Bank

MDB	Multilateral Development Bank
MEL	Monitoring, Evaluation, and Learning
mi^2	Square miles
MLRA	Major Land Resource Areas
MMT CO_2 Eq.	Million Metric Tons of Carbon Dioxide Equivalent
mpg	Miles per Gallon
MPGs	Modalities, Procedures and Guidelines
MSE	Molten Salt Electrolysis
MSW	Municipal Solid Waste
MW	Megawatts
N_2O	Nitrous oxide
NAP	National Adaptation Plan
NASA	National Aeronautics and Space Administration
NASA	National Aeronautics and Space Administration
NBS	Nature-Based Solutions
NC	National Communications
NCA4	Fourth National Climate Assessment
NCA5	Fifth National Climate Assessment
NCEI	National Centers for Environmental Information
Nd	Neodymium
NDC	Nationally Determined Contribution
NEMS	National Energy Modeling System
NETL	National Energy Technology Laboratory
NEVI	National Electric Vehicle Infrastructure
NF_3	Nitrogen trifluoride
NHTSA	National Highway Traffic Safety Administration
NIABC	National Initiative to Advance Building Codes
NID	National Inventory Document
NIR	National Inventory Report

NIST	National Institute for Science and Technology	**PREPARE**	President's Emergency Plan for Adaptation and Resilience
NMOC	Nonmethane Organic Compounds	**RAMP**	Resilience and Adaptation Mainstreaming Project
NOAA	National Oceanic and Atmospheric Administration	**RCPP**	Regional Conservation Partnership Program
NPAD	National Planning and Agreements Database	**RDD&D**	Research, development, demonstration, and deployment
NRCS	Natural Resources Conservation Service	**RECS**	Residential Energy Consumption Survey
NRECA	National Rural Electric Cooperative Association	**REDD+**	Reducing Emissions from Deforestation and Forest Degradation
NREL	National Renewable Energy Laboratory	**ReEDS**	Regional Energy Deployment System
NSPS	New Source Performance Standards	**REO**	Recycling Education and Outreach
NSTC	National Science and Technology Council	**RESP**	Rural Energy Savings Program
NWEE	Nexus for Water, Food and Energy	**RFS**	Renewable Fuels Standard
OAP	Office of Atmospheric Programs	**RIA**	Regulatory Impact Analysis
OCAP	Ocean Climate Action Plan	**RNG**	Renewable Natural Gas
OCED	Organization for Economic Co-Operation and Development	**RPA**	Resources Planning Act
ODA	Official Development Assistance	**RRIF**	Railroad Rehabilitation and Improvement Financing
ODS	Ozone Depleting Substances	**RUS**	Rural Utilities Services
OMB	Office of Management and Budget	**SAF**	Sustainable Aviation Fuels
OMEGA	Optimization Model for Reducing Emissions of Greenhouse Gases from Automobiles	**SCS**	Subcommittee on Climate Services
OOF	Other Official Flows	**SF_6**	Sulfur hexafluoride
OP	Office of Policy	**SFLR**	Sustainable Forestry and African American Land Retention Program
OSHA	Occupational Safety and Health Administration	**SHuFFLE**	Support Hub for Forest Finance and Landscape Engagement
PACE	Powering Affordable Clean Energy	**SIDS**	Small Island Developing States
PAM	Policies and Measures	**SNAP**	Significant New Alternatives Policy
PAMs	Partner Account Managers	**SOFF**	Systemic Observations Finance Facility
PFC	Perfluorocarbon	**STC2ERTA**	State annual CO_2 equivalent total output emission rate
PHEV	Plug-in Hybrid Electric Vehicle	**SUV**	Sports Utility Vehicle
PHMSA	Pipeline and Hazardous Materials Safety Administration	**TA**	Technical Assistance
pp	Percentage Point	**TEC**	Technology Executive Committee

TIFIA	Transportation Infrastructure Finance and Innovation Act
TRIPS	Trate-Related Aspects of Intellectual Property Rights
UAE	United Arab Emirates
UCF	Urban and Community Forestry
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USCEI	United States Climate Extremes Index
USDA	United States Department of Agriculture
USDN	Urban Sustainability Directors Network
USFS	United States Forest Service
USGCRP	United States Global Change Research Program
USGS	United States Geological Survey
USREP	United States Regional Energy Policy
USTDA	United States Trade and Development Agency
VACS	Vision for Adapted Crops and Soils
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WTO	World Trade Organization
WUI	Wildland Urban Interface

Chapter 1:

Introduction

Chapter 1: Introduction

Overview

The 2024 Biennial Transparency Report of the United States describes the unprecedented efforts that have enabled the United States to get on a path to achieve historic, economy-wide emissions reductions while creating sustainable economies, new jobs, and robust economic development at home and abroad.

This report summarizes a series of laws, policies, and measures that will contribute to the United States achieving its nationally determined contribution (NDC) target to reduce economy-wide net greenhouse gas (GHG) emissions by 50-52 percent below 2005 levels in 2030, as well as to achieving net-zero emissions no later than 2050. These actions are designed to contribute to a global goal to limit average temperature increase to no more than 1.5 degrees Celsius above pre-industrial levels this century.

Domestically, these actions have stimulated over $450 billion in announced private investment in clean energy manufacturing and deployment since the start of the Biden-Harris Administration and created over 330,000 clean energy jobs in just over two years, with an additional 1.5 million jobs projected to be created over the next decade. They have also strengthened our national security, allowing our country and communities to create clean energy supply chains, reduce harmful pollutants, and be better prepared for and more resilient to climate impacts.

This report reflects not only actions by the Federal Government, but those of state and Tribal governments, businesses, and other stakeholders engaged in taking action, building awareness, and advancing cutting-edge science and technology to enhance global climate efforts. Our efforts to support climate action internationally are also described.

In total, these efforts help keep within reach a safer, cleaner, healthier future for ourselves and generations to come.

Context

Combatting the climate crisis is among the most urgent and important tasks facing humanity. The United States, like the rest of the world, already faces the consequences of living in a rapidly warming planet in the form of unprecedented wildfires, drought, floods, and hurricanes. In 2024, the temperature reached over 100 degrees Fahrenheit for more than 100 consecutive days in Phoenix, Arizona, and surrounding areas. This summer and fall, hurricanes supercharged by warm ocean water slammed into the southeastern United States while record wildfires devastated Texas, California, and other states, killing hundreds and costing billions in damages. In 2024 alone, the United States experienced 24 separate billion-dollar weather and climate disaster events.[1]

At the same time, this crisis also presents one of the greatest opportunities in human history to clean and protect our air, lands, and waters, to create new, good-paying jobs and careers, to develop a clean, domestic energy industry, and to help our partners create sustainable economies.

For example, since its passage in 2022, the Inflation Reduction Act (IRA) has already generated economic growth while cutting emissions at home and abroad. Domestically, the IRA is projected to more than double U.S. deployment of solar, wind, and battery storage by 2030, with new and extended tax incentives for clean energy, and accelerate transitions to clean technologies across other sectors. The IRA is also projected to produce more than $5 trillion in global economic benefits from reduced climate pollution between now and 2050. According to one analysis, every tonne of carbon pollution saved by the IRA in the United States has the potential to save up to 2.9 tonnes outside our borders, while helping to bring down the costs of clean energy globally.[2]

The IRA complements legislation such as the Bipartisan Infrastructure Law, which provides historic levels of support for upgrading the U.S. power grid to transmit more clean energy and withstand extreme weather; building a nationwide network of electric vehicle chargers to support widespread EV adoption; deploying zero-emission school and transit buses; improving public transit and passenger rail; deploying zero-emission school and transit buses; weatherizing low-income homes; cleaning up legacy pollution; supporting demonstration projects and research hubs for next-generation clean technologies; and boosting resilience to intensifying climate impacts.

The United States has ramped up domestic and international actions to address emissions of methane. The United States finalized ambitious oil and gas methane regulations that will reduce emissions by nearly 80% compared to emissions without the rule, bringing down costs for consumers and avoiding the waste of natural gas resources. The United States has also advanced voluntary efforts to cut methane from agricultural and landfills by boosting innovation and reducing food loss and waste. Internationally, the United States launched the Global Methane Pledge to reduce human-caused methane emissions at least 30% by 2030 from 2020 levels. The Pledge has catalyzed international action, financing, and policy support for methane abatement across the nearly 160 countries who have joined the Pledge.

The United States also took action to reduce GHG emissions through a phase-down of the production and consumption of hydrofluorocarbons (HFCs), super-polluting chemicals that are hundreds to thousands of times more powerful than carbon dioxide, by enacting the American Innovation and Manufacturing Act of 2020 and ratifying the Kigali Amendment to the Montreal Protocol in 2022.

Beyond our commitment to address climate change at home, the United States focused on supporting partners around the world in enhancing resilience and curbing GHG emissions. In November 2024, President Biden announced that the United States had met his pledge to work with the U.S. Congress to quadruple U.S. annual public climate finance to developing countries to $11 billion annually by 2024.[1] Meeting this goal included achieving the level of support promised in the President's Emergency Plan for Adaptation and Resilience (PREPARE), which has delivered $3 billion in adaptation finance annually to developing countries to support strengthening climate information services and early warning systems.

These federal actions complement the intense work undertaken throughout the United States by a range of other stakeholders. U.S. states, territories, cities, and Tribal governments remain at the forefront of combatting climate change, with ambitious climate targets consistent with the Paris Agreement temperature goal, clean energy and zero emission vehicle goals, and plans to enhance resilience and adaptation. Thousands of U.S. companies have similarly committed to deep reductions in their own value chains on a trajectory to net zero, and to supporting mitigation actions far beyond their own supply chains. U.S. financial institutions are increasingly incorporating climate-related financial risk into their portfolios and also financing a range of climate investments around the world. U.S. academics lead cutting-edge research and development efforts that will deliver the next generation of climate technologies. And U.S. civil society has been at the forefront of advocating for and supporting climate action in the United States and around the world.

In the past four years, the United States has clearly shown it is possible to reduce both domestic and international emissions while creating good-paying jobs and conserving and protecting vital lands and waters. In the years ahead, humanity can and must continue to rise to this challenge.

Structure

This first Biennial Transparency Report reflects the efforts of the United States to combat climate change with the urgency it deserves, reducing net GHG emissions aggressively, adapting to the impacts of climate change, and assisting partners around the world in taking action to do the same.

Following the Introduction, Chapter 2 summarizes the Inventory of U.S. Greenhouse Gas Emissions and Sinks that the United States submitted in April 2024, covering the years 1990-2022, with accompanying summary tables and charts.

Chapter 3 summarizes information on policies and measures that mitigate climate change, as well as information on progress towards the United States' 2030 NDC target. This chapter focuses primarily on developments since the beginning of 2022, though it also includes a

1 Relative to the average level during the second half of the Obama-Biden Administration (FY 2013-2016).

selection of previously reported policies and measures. These policies and measures reflect an intensive effort to address GHG emissions from all sources as well as removals by advancing clean energy, transportation, buildings, and industrial processes as well as climate-smart agriculture and forestry. This chapter includes a sample of the broad range of policies and programs put into place by non-federal governments, including U.S. states, territories, Tribal Nations, and local governments, to combat the climate crisis.

Chapter 3 also includes projections of expected GHG emissions and removals associated with current policies and measures based on our baseline model utilizing data available as of May 2024, extending through 2040. As with previous reports, these projections include a range reflecting the uncertainty with respect to energy and the future of the terrestrial carbon sink.

Chapter 4 summarizes efforts by the federal government, subnational governments, Tribes, businesses, and civil society to increase the resilience of American communities, the economy, infrastructure and landscapes to impacts from extreme events and changing conditions, including those related to climate change. It also highlights the findings of recent scientific assessments of U.S. vulnerability to climate change and its impacts. This chapter also serves as the United States' second Adaptation Communication under the Paris Agreement.

Chapter 5 contains information on U.S. support for developing country partners on finance, technology, and capacity building to assist in implementing and achieving ambitious climate goals, reduce vulnerabilities and adapt to climate change impacts, curb GHG emissions and increase sequestration, and monitor implementation and results.

Chapter 6 summarizes information on areas of improvement. In future years, this chapter will track recommendations and encouragements from the technical expert review team and the implementation status of those areas for improvement.

Annex 1 provides information on mitigation policies and measures in a tabular format. Annex 2 provides the methodology used for policies and measures with quantified GHG mitigation estimates. Annex 3 describes the methodology for projected GHG emissions. Annex 4 presents tables on public financial support provided to developing countries to support climate action. Annex 5 provides methodological information related to financial support.

[1] “Billion-Dollar Weather and Climate Disasters.” *National Centers for Environmental Information, National Oceanic and Atmospheric Administration*, 2023, www.ncei.noaa.gov/access/billions/time-series.
[2] “Global Emerging Climate Technology Diffusion and the Inflation Reduction Act.” *Rhodium Group*, rhg.com/research/emerging-climate-technology-ira/.

U.S. Biennial Transparency Report

Chapter 2:

Greenhouse Gas Inventory Summary

Chapter 2: Greenhouse Gas Inventory Summary

Introduction

The United States is committed to providing annual, transparent reporting on current and historical greenhouse gas (GHG) emissions and removals, via the *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*[1] As a Party to the U.N. Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, the United States is committed to submitting a national inventory of anthropogenic sources and sinks of GHGs by April 15 of each year. The United States has prepared this summary of its National Inventory Report (NIR) – that is, its National Inventory Document (NID) and Common Reporting Tables (CRT) that accompany this report – consistent with its obligations under those agreements.

This chapter summarizes the latest information on U.S. anthropogenic GHG emission trends from 1990 through 2022, consistent with information submitted under the UNFCCC and Paris Agreement in April 2024. To ensure that the U.S. NIR is comparable with those of other Parties, the emissions and removals estimates presented in this report and summarized in this chapter are organized by source and sink categories and calculated using methodologies consistent with those recommended in the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.[2] Additionally, the NIR has continued to incorporate new methodologies and data supplements and refinements to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.[3,4] As with each submission, the "Recalculations and Improvements" chapter of the April 2024 U.S. NID includes a description on improvements and recalculations relative to the previous submission, consistent with the objective of continuous improvement. For this latest release, the U.S. Environmental Protection Agency (EPA) has made several important improvements to methods and data along with completeness improvements. For example, EPA has incorporated new data and methods for estimating emissions and removals from the forest land remaining forest land category. While not summarized in this chapter, the United States reports on GHG precursors in its NIR.

Institutional Arrangements

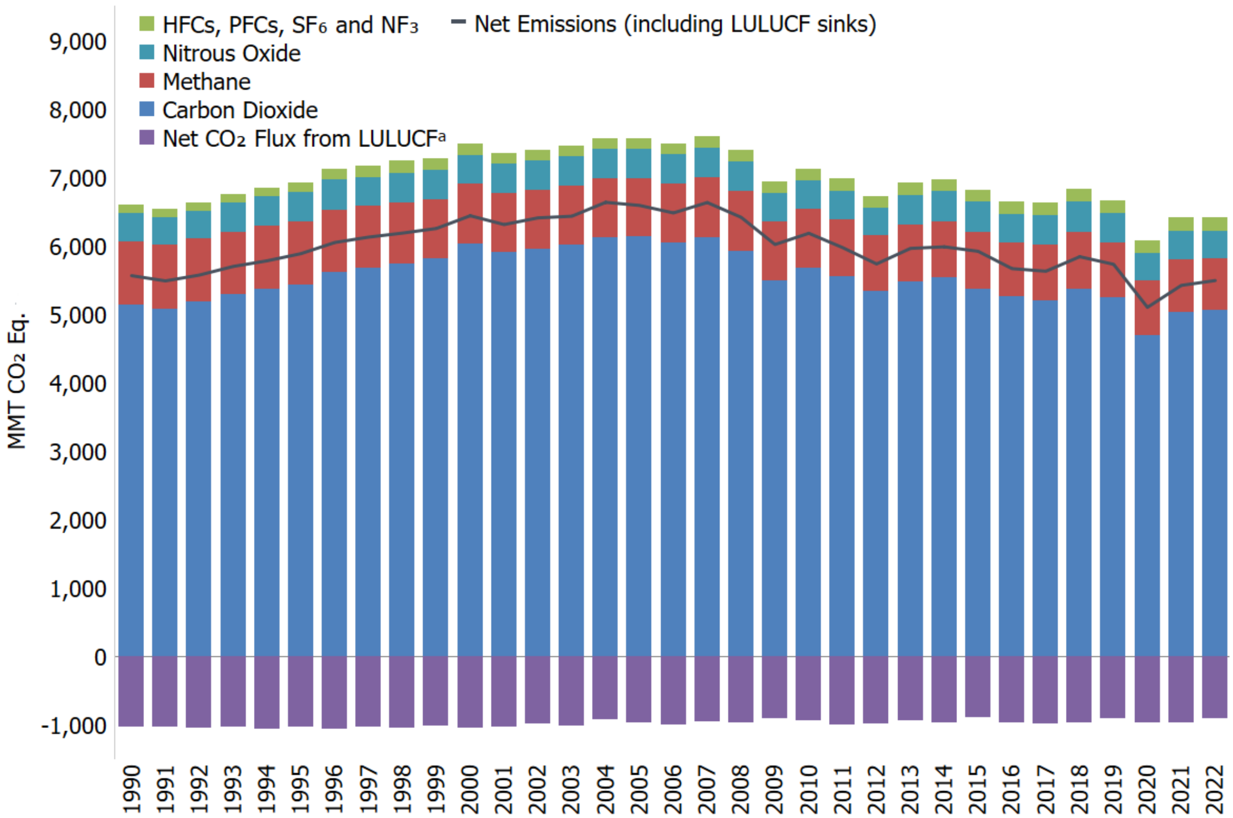
Federal and state government authorities, research and academic institutions, industry associations, and private consultants are involved in supplying data to, preparing portions of, and/or reviewing the NIR. The U.S. Department of Agriculture's Forest Service and Agricultural Research Service, National Oceanic and Atmospheric Administration (NOAA), Federal Aviation Administration (FAA), and Department of Defense (DOD) contribute to the collection of data and also support compilation of the estimates and supporting analysis. Other U.S. agencies provide official data for use in the NIR. For example, the U.S. Department of Energy's Energy Information Administration provides national fuel consumption data, and DOD provides data on military fuel consumption and use of bunker fuels. The institutional arrangements for preparing the NIR are explained in more detail in the *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2022*, in Section 1.2 on National Inventory Arrangements.[5] The institutional arrangements for development of the NIR have not changed since the *2022 U.S. Climate Ambition Report, Eighth National Communication, and Fifth Biennial Report of the United States of America to the United Nations Framework Convention on Climate Change.*[6] The EPA, in cooperation with other U.S. agencies, prepares the annual NIR. Within EPA, the Office of Atmospheric Programs (OAP) is the lead office responsible for the emission calculations provided in the Inventory, as well as the completion of the NID and the preparation of the CRT. EPA's Office of Transportation and Air Quality is also involved in calculating transportation and mobile combustion emissions, and EPA's Office of Research and Development compiles emissions and removals from management of flooded lands for the NIR. While the U.S. Department of State is the UNFCCC and Paris Agreement focal point, EPA's OAP serves as the Inventory focal point for review, covering technical questions and comments on the NIR.

Recent Trends in U.S. Greenhouse Gas Emissions and Sinks

In 2022, total gross U.S. GHG emissions were 6,343.2 million metric tonnes of carbon dioxide equivalent (MMT CO_2 Eq.). Total gross U.S. emissions decreased by 3 percent from 1990 to 2022, down from a high of 15.2 percent above 1990 levels in 2007. Total gross emissions increased from 2021 to 2022 by 0.2 percent (14.4 MMT CO_2 Eq.). Net emissions (i.e., including sinks) were 5,489.0 MMT CO_2 Eq. Overall, net emissions increased 1.3 percent from 2021 to 2022 and decreased 16.7 percent from 2005 levels, as shown in Table 2-1. Between 2021 and 2022, the increase in total gross greenhouse gas emissions was driven largely by an increase in CO_2 emissions from fossil fuel combustion across most end-use sectors due in part to increased energy use from the continued rebound of economic activity after the height of the COVID-19 pandemic. In 2022, CO_2 emissions from fossil fuel combustion increased by 1.0 percent relative to the previous year and were 1.1 percent below emissions in 1990. Carbon dioxide emissions from natural gas use increased by 5.2 percent (84.8 MMT CO_2 Eq.) from 2021, while CO_2 emissions from coal consumption decreased by 6.1 percent (58.6 MMT CO_2 Eq.) from 2021 to 2022. The increase in natural gas consumption and associated emissions in 2022 is observed across all sectors except U.S. territories, while the coal decrease is due to reduced use in the electric power sector. Emissions from petroleum use also increased by 0.9 percent (19.0 MMT CO_2 Eq.) from 2021 to 2022. The increase in net emissions between 2021 and 2022 was also partly due to an increase in CO2 emissions from forest fires in Alaska, noting c carbon sequestration from the Land Use, Land-Use Change, and Forestry (LULUCF) sector offset 14.5 percent of total gross emissions in 2022.

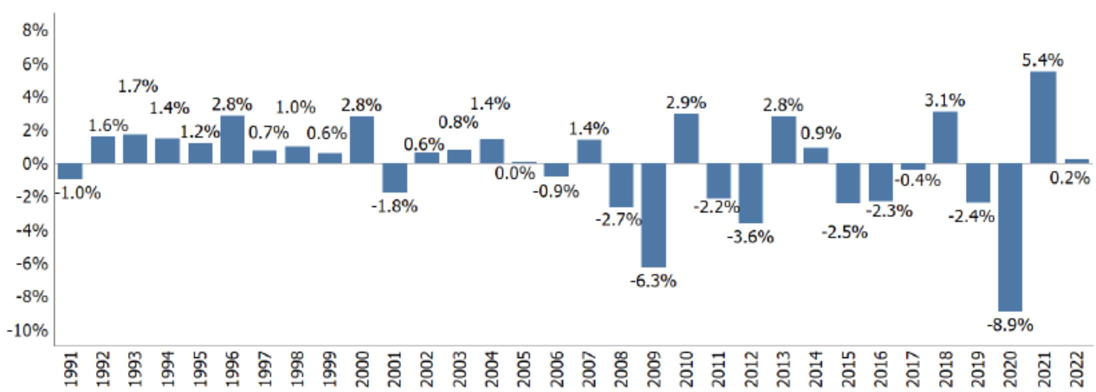
Figure 2-1 and Figure 2-2 illustrate the overall trends in both total U.S. GHG emissions by gas and annual changes in net emissions since 1990. Table 2-1 provides a detailed summary of U.S. GHG emissions and sinks for 1990 through 2022. Overall, from 1990 to 2022, total gross emissions of CO_2 decreased by 1.5 percent, total emissions of methane ($CH_{4,}$ excluding LULUCF sources) decreased by 19.4 percent, and total emissions of nitrous oxide (N_2O, excluding LULUCF sources) decreased by 4.5 percent. During the same period, aggregate weighted emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), Sulfur hexafluoride ($SF_{6)}$, and Nitrogen trifluoride (NF_3) rose by 57.9 percent. Despite being emitted in smaller quantities relative to the other principal GHGs, emissions of HFCs, PFCs, SF_6, and NF_3 are significant because many of them have both extremely high global warming potentials (GWPs) and, in the cases of PFCs, SF_6, and NF_3, long atmospheric lifetimes.[7] U.S. GHG emissions were partly offset by net carbon (C) sequestration in managed forests, trees in urban areas, agricultural soils, landfilled yard trimmings, and coastal wetlands, which together offset 14.5 percent of total emissions in 2022. Emissions of CH_4 and N_2O from LULUCF activities in 2022 were 67.6 MMT CO_2 Eq. and represent 1 percent of total GHG emissions. Figure 2-1 and Figure 2-2 illustrate the overall trends in total U.S. emissions by gas, annual percent changes, and relative change since 1990 for each year of the time series. The discussion that follows these figures describes each gas's contribution to total U.S. GHG emissions and sinks in more detail.

Figure 2-1: U.S. Greenhouse Gas Emissions and Sinks by Gas



Source: U.S. EPA[8]

Figure 2-2: Annual Percent Change in Gross U.S. Greenhouse Gas Emissions Relative to the Previous Year

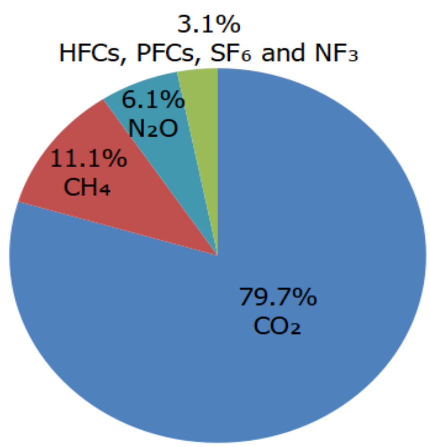


Source: U.S. EPA[9]

Figure 2-3 illustrates the relative contribution of the direct GHGs to total U.S. emissions in 2022. Table 2-1 provides a detailed summary of U.S. GHG emissions and sinks for 1990 through 2022. The primary GHG emitted by human activities in the United States was CO_2, representing approximately 79.7 percent of total GHG emissions. The largest source of CO_2, and of overall

GHG emissions, was fossil fuel combustion, primarily from transportation and power generation. Methane (CH_4) emissions account for approximately 11.1 percent of emissions. The major sources of methane include enteric fermentation associated with domestic livestock, natural gas systems, and decomposition of wastes in landfills. Nitrous oxide emissions account for 6.1 percent of 2022 emissions, and major sources include agricultural soil management, wastewater treatment, stationary sources of fuel combustion, and manure management. Ozone depleting substance substitute emissions were the primary contributors to aggregate HFC emissions. PFC emissions were primarily attributable to electronics manufacturing, fluorochemical production, and primary aluminum production. Electrical transmission and distribution systems accounted for most sulfur hexafluoride emissions. The electronics industry and fluorochemical production is the only source of NF_3 emissions. Collectively, fluorinated emissions account for just over 3 percent of 2022 emissions.

Figure 2-3: 2022 U.S. Greenhouse Gas Emissions by Gas (Percentages based on MMT CO_2 Eq.)



Source: U.S. EPA[10]

Table 2-1: Recent Trends in U.S. Greenhouse Gas Emission and Sinks (MMT CO_2 Eq.)

Gas/Source	1990	2005	2018	2019	2020	2021	2022
CO_2	**5,131.6**	**6,126.9**	**5,362.2**	**5,234.5**	**4,689.0**	**5,017.2**	**5,053.0**
Fossil Fuel Combustion	4,752.2	5,744.1	4,988.2	4,852.6	4,341.7	4,654.3	4,699.4
Transportation	*1,468.9*	*1,858.6*	*1,813.1*	*1,816.6*	*1,572.8*	*1,753.5*	*1,751.3*
Electric Power Sector	*1,820.0*	*2,400.1*	*1,753.4*	*1,606.7*	*1,439.6*	*1,540.9*	*1,531.7*
Industrial	*876.5*	*847.6*	*810.5*	*809.8*	*762.0*	*780.5*	*801.1*
Residential	*338.6*	*358.9*	*338.9*	*342.9*	*314.8*	*318.0*	*334.1*
Commercial	*228.3*	*227.1*	*246.3*	*251.7*	*229.3*	*237.5*	*258.7*
U.S. territories	*20.0*	*51.9*	*25.9*	*24.8*	*23.3*	*23.8*	*22.6*
Non-Energy Use of Fuels	99.1	125.0	118.4	106.5	97.8	111.6	102.8
Cement Production	33.5	46.2	39.0	40.9	40.7	41.3	41.9
Iron and Steel Production & Metallurgical Coke Production	104.7	70.1	42.9	43.1	37.7	41.9	40.7
Natural Gas Systems	32.4	26.3	32.8	38.5	36.7	35.8	36.5
Petrochemical Production	20.1	26.9	27.2	28.5	27.9	30.7	28.8
Petroleum Systems	9.6	10.2	34.8	45.5	28.9	24.1	22.0

Ammonia Production	14.4	10.2	12.7	12.4	13.0	12.2	12.6
Incineration of Waste	12.9	13.3	13.3	12.9	12.9	12.5	12.4
Lime Production	11.7	14.6	13.1	12.1	11.3	11.9	12.2
Other Process Uses of Carbonates	7.1	8.5	7.9	9.0	9.0	8.6	10.4
Urea Consumption for Non-Agricultural Purposes	3.8	3.7	6.1	6.2	5.8	6.6	7.1
Urea Fertilization	2.4	3.5	4.9	5.0	5.1	5.2	5.3
Carbon Dioxide Consumption	1.5	1.4	4.1	4.9	5.0	5.0	5.0
Liming	4.7	4.4	2.2	2.2	2.9	2.4	3.3
Coal Mining	4.6	4.2	3.1	3.0	2.2	2.5	2.5
Glass Production	2.3	2.4	2.0	1.9	1.9	2.0	2.0
Soda Ash Production	1.4	1.7	1.7	1.8	1.5	1.7	1.7
Titanium Dioxide Production	1.2	1.8	1.5	1.3	1.3	1.5	1.5
Aluminum Production	6.8	4.1	1.5	1.9	1.7	1.5	1.4
Ferroalloy Production	2.2	1.4	2.1	1.6	1.4	1.6	1.3
Zinc Production	0.6	1.0	1.0	1.0	1.0	1.0	0.9
Phosphoric Acid Production	1.5	1.3	0.9	0.9	0.9	0.9	0.8
Lead Production	0.5	0.6	0.5	0.5	0.5	0.4	0.4
Carbide Production and Consumption	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Abandoned Oil and Gas Wells	+	+	+	+	+	+	+
Substitution of Ozone Depleting Substances	+	+	+	+	+	+	+
Magnesium Production and Processing	0.1	+	+	+	+	+	+
Biomass and Biodiesel Consumption[a]	*237.9*	*245.4*	*336.0*	*333.1*	*295.7*	*303.0*	*305.4*
International Bunker Fuels[b]	*103.6*	*113.3*	*124.3*	*113.6*	*69.6*	*80.2*	*98.2*
CH_4[c]	**871.7**	**795.4**	**771.5**	**754.3**	**735.3**	**720.5**	**702.4**
Enteric Fermentation	183.1	188.2	196.8	197.3	196.3	196.5	192.6
Natural Gas Systems	218.8	210.1	190.3	188.7	180.3	174.6	173.1
Landfills	197.8	147.7	126.3	128.7	124.1	122.0	119.8
Manure Management	39.1	55.0	67.7	66.7	66.9	66.4	64.7
Coal Mining	108.1	71.5	59.1	53.0	46.2	44.7	43.6
Petroleum Systems	49.4	48.2	59.0	52.2	53.3	48.6	39.6
Wastewater Treatment	22.7	22.7	21.4	21.1	21.0	20.7	20.8
Rice Cultivation	18.9	20.6	19.9	15.6	18.6	18.3	18.9
Stationary Combustion	9.7	8.8	9.6	9.8	8.0	8.0	8.6
Abandoned Oil and Gas Wells	7.8	8.2	8.4	8.5	8.5	8.6	8.5
Abandoned Underground Coal Mines	8.1	7.4	6.9	6.6	6.5	6.3	6.3
Mobile Combustion	7.2	4.3	2.8	2.9	2.5	2.6	2.6
Composting	0.4	2.1	2.5	2.5	2.6	2.6	2.6
Field Burning of Agricultural Residues	0.5	0.6	0.6	0.7	0.6	0.6	0.6
Anaerobic Digestion at Biogas Facilities	+	+	+	+	+	+	+
Carbide Production and Consumption	+	+	+	+	+	+	+
Ferroalloy Production	+	+	+	+	+	+	+
Iron and Steel Production & Metallurgical Coke Production	+	+	+	+	+	+	+
Petrochemical Production	+	+	+	+	+	+	+
Incineration of Waste	+	+	+	+	+	+	+
International Bunker Fuels[b]	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
N_2O[c]	**408.2**	**419.2**	**439.5**	**416.4**	**391.2**	**398.2**	**389.7**
Agricultural Soil Management	288.8	294.1	333.4	315.6	292.1	298.0	290.8
Stationary Combustion	22.3	30.5	25.1	22.2	20.5	22.0	24.7
Wastewater Treatment	14.8	18.1	21.2	21.6	22.3	22.1	21.9
Manure Management	13.4	15.2	16.6	16.8	16.9	17.1	17.0
Mobile Combustion	38.4	37.0	17.7	19.1	16.1	16.8	16.7
Nitric Acid Production	10.8	10.1	8.5	8.9	8.3	7.9	8.6
N_2O from Product Uses	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Adipic Acid Production	13.5	6.3	9.3	4.7	7.4	6.6	2.1
Composting	0.3	1.5	1.8	1.8	1.8	1.8	1.8

Caprolactam, Glyoxal, and Glyoxylic Acid Production	1.5	1.9	1.3	1.2	1.1	1.2	1.3
Incineration of Waste	0.4	0.3	0.4	0.4	0.3	0.4	0.3
Electronics Industry	+	0.1	0.2	0.2	0.3	0.3	0.3
Field Burning of Agricultural Residues	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas Systems	+	+	+	+	+	+	0.2
Petroleum Systems	+	+	+	+	+	+	+
International Bunker Fuels[b]	*0.8*	*0.9*	*1.0*	*0.9*	*0.5*	*0.6*	*0.8*
HFCs	**47.7**	**121.7**	**163.9**	**168.2**	**170.3**	**177.0**	**182.8**
Substitution of Ozone Depleting Substances	0.3	99.5	157.9	162.1	166.2	172.6	178.1
Fluorochemical Production	47.3	22.1	5.7	5.7	3.8	4.0	4.3
Electronics Industry	0.2	0.2	0.3	0.3	0.3	0.4	0.3
Magnesium Production and Processing	0.0	0.0	0.1	0.1	0.1	+	+
PFCs	**39.5**	**10.2**	**7.4**	**7.3**	**6.6**	**6.3**	**6.7**
Fluorochemical Production	17.5	4.0	2.9	3.0	2.5	2.6	3.0
Electronics Industry	2.5	3.0	2.9	2.6	2.5	2.6	2.7
Aluminum Production	19.3	3.1	1.4	1.4	1.4	0.9	0.8
SF_6 and PFCs from Other Product Use	0.1	0.1	0.2	0.2	0.2	0.1	0.2
Substitution of Ozone Depleting Substances	0.0	+	+	+	+	+	+
Electrical Equipment	0.0	+	0.0	+	+	+	+
SF_6	**37.9**	**20.2**	**7.6**	**8.4**	**8.1**	**8.5**	**7.6**
Electrical Equipment	24.7	11.8	5.0	6.1	5.9	6.0	5.1
Magnesium Production and Processing	5.6	3.0	1.1	0.9	0.9	1.2	1.1
Electronics Industry	0.5	0.8	0.8	0.8	0.8	0.9	0.8
SF_6 and PFCs from Other Product Use	1.3	1.3	0.8	0.6	0.5	0.4	0.6
Fluorochemical Production	5.8	3.3	+	+	+	+	+
NF_3	**0.3**	**1.0**	**0.7**	**1.1**	**1.3**	**1.1**	**1.1**
Electronics Industry	+	0.4	0.5	0.5	0.6	0.6	0.6
Fluorochemical Production	0.3	0.6	0.1	0.6	0.7	0.5	0.5
Total Gross Emissions (Sources)	**6,536.9**	**7,494.6**	**6,752.7**	**6,590.1**	**6,001.8**	**6,328.8**	**6,343.2**
LULUCF Emissions[c]	**58.0**	**68.9**	**62.8**	**58.0**	**68.4**	**72.9**	**67.6**
CH_4	53.1	58.5	55.5	52.5	59.3	62.1	58.4
N_2O	4.8	10.3	7.3	5.5	9.1	10.7	9.1
LULUCF Carbon Stock Change[e]	**(1,034.7)**	**(976.6)**	**(978.3)**	**(921.6)**	**(972.8)**	**(983.4)**	**(921.8)**
LULUCF Sector Net Total[f]	**(976.7)**	**(907.7)**	**(915.5)**	**(863.6)**	**(904.4)**	**(910.6)**	**(854.2)**
Net Emissions (Sources and Sinks)	**5,560.2**	**6,586.9**	**5,837.3**	**5,726.6**	**5,097.4**	**5,418.2**	**5,489.0**

+ Does not exceed 0.05 MMT CO_2 Eq.
NO (Not Occurring)
[a] Emissions from biomass and biofuel consumption are not included specifically in Energy sector totals. Net carbon fluxes from changes in biogenic carbon reservoirs are accounted for in the estimates for LULUCF.
[b] Emissions from international bunker fuels are not included in totals.
[c] LULUCF emissions of CH_4 and N_2O are reported separately from gross emissions totals. LULUCF emissions include the CH_4 and N_2O emissions reported for peatlands remaining peatlands, forest fires, drained organic soils, grassland fires, and coastal wetlands remaining coastal wetlands; CH_4 emissions from land converted to coastal wetlands, flooded land remaining flooded land, and land converted to flooded land; and N_2O emissions from forest soils and settlement soils. Refer to Table 2-5 for a breakout of emissions and removals for LULUCF by gas and source category.
[d] Small amounts of PFC emissions from this source are included under HFCs due to confidential business information.
[e] LULUCF carbon stock change is the net carbon stock change from the following categories: forest land remaining forest land, land converted to forest land, cropland remaining cropland, land converted to cropland, grassland remaining grassland, land converted to grassland, wetlands remaining wetlands, land converted to wetlands, settlements remaining settlements, and land converted to settlements. Refer to Table 2-5 for a breakout of emissions and removals for LULUCF by gas and source category.
[f] The LULUCF sector net total is the net sum of all LULUCF CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes.
Notes: Total (gross) emissions are presented without LULUCF. Net emissions are presented with LULUCF. Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Carbon Dioxide Emissions

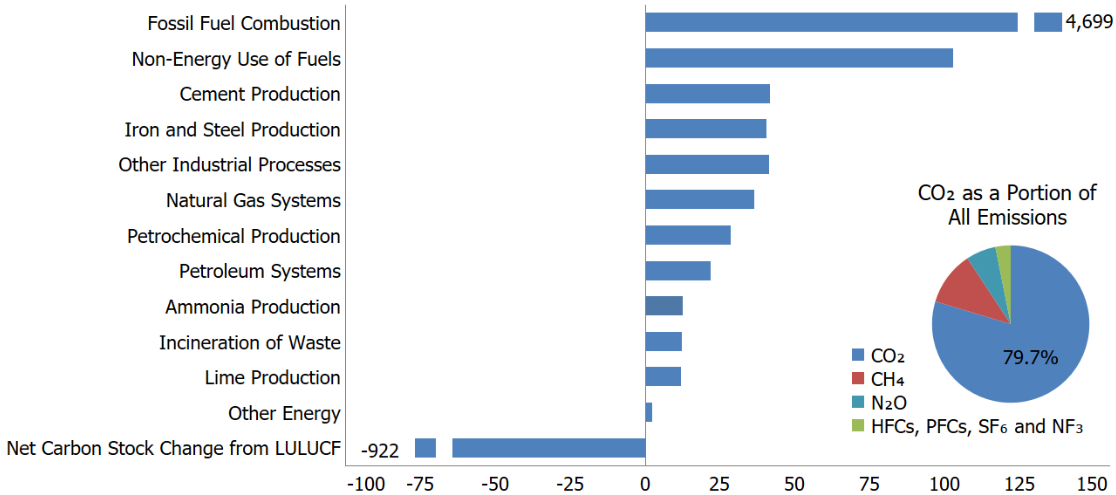
The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tonnes of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, global carbon fluxes among these various reservoirs are roughly balanced.[1]

Since the Industrial Revolution (i.e., about 1750), global atmospheric concentrations of CO_2 have risen approximately 49.5 percent,[11] principally due to the combustion of fossil fuels for energy. Globally, an estimated 33,423 MMT of CO_2 were added to the atmosphere through the combustion of fossil fuels in 2022, of which the United States accounted for approximately 14.1 percent.[12]

Overall CO_2 emissions have decreased by 1.5 percent since 1990 and increased by 0.7 percent since 2021, consistent with trends in fuel combustion emissions. Within the United States, fossil fuel combustion accounted for 93.0 percent of CO_2 gross emissions in 2022. Nationally, the transportation sector was the largest emitter of CO_2 in 2022 followed by electric power generation. There are 27 additional sources of CO_2 emissions included in the NID. Although not illustrated in Figure 2-4, changes in land use and forestry practices can also lead to net CO_2 emissions (e.g., through conversion of forest land to agricultural or urban use) or to a net sink for CO_2 (e.g., through net additions to forest biomass). See Table 2-1 for more on these emissions and removals.

[1] The term “flux” is used to describe the exchange of CO_2 to and from the atmosphere, with net flux being either positive or negative depending on the overall balance. Removal and long-term storage of CO_2 from the atmosphere is also referred to as “carbon sequestration.”

Figure 2-4 2022 Sources of CO_2 Emissions



Source: U.S.EPA[13]

Box 2-1: Global Warming Potentials

Recent decisions under the Paris Agreement[14] and the UNFCCC[15] require Parties to use 100-year time-horizon GWP values from the IPCC *Fifth Assessment Report* (AR5) for calculating CO_2-equivalents in their national reporting by the end of 2024. This reflects updated science and ensures that national GHG inventories reported by all Parties are comparable. This report reflects CO_2-equivalent GHG emission totals using 100-year AR5 GWP values (see Table 2-2).[16]

Table 2-2: Global Warming Potentials (100-Year Time Horizon) Used in this Report

Gas	GWP
CO_2	1
CH_4[a]	28
N_2O	265
HFCs	up to 12,400
PFCs	up to 11,100
SF_6	23,500
NF_3	16,100
Other Fluorinated Gases	See Annex 6

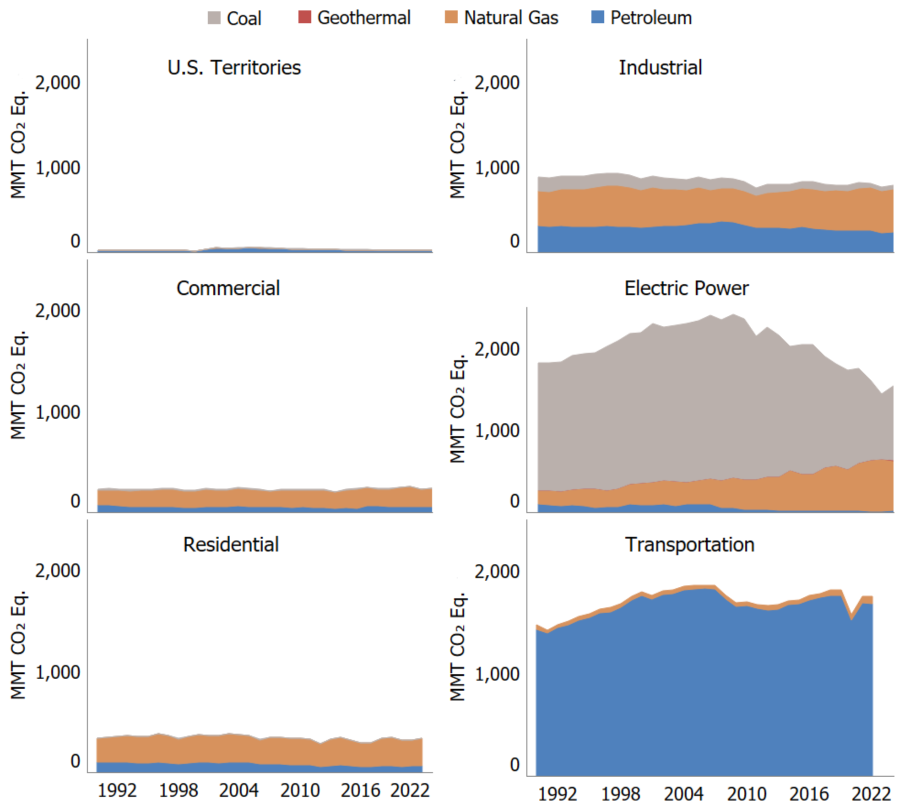
[a] The GWP of CH_4 includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to production of CO_2 is not included. See Annex 6 for additional information.
Source: IPCC (2013).

Historically, changes in CO_2 emissions from fossil fuel combustion have been the driving factor affecting U.S. emissions trends. Between 1990 and 2022, CO_2 emissions from fossil fuel combustion decreased 1.1 percent. In 2022, CO_2 emissions from fossil fuel combustion were

18.2 percent (1,044.7 MMT CO_2 Eq.) below 2005 levels. From 2021 to 2022, these emissions increased by 1 percent (45 MMT CO_2 Eq.). Changes in CO_2 emissions from fossil fuel combustion since 1990 are affected by many long-term and short-term factors, including population and economic growth, energy price fluctuations and market trends, technological changes, carbon intensity of energy fuel choices, and seasonal temperatures. Important drivers include changes in demand for energy and a general decline in the overall carbon intensity of fuels combusted for energy in recent years by non-transport sectors of the economy. Between 2019 and 2021, changes in economic activity and travel due to the COVID-19 pandemic and the subsequent recovery had significant impacts on energy use and fossil fuel combustion emissions. Long-term factors affecting energy demand include population and economic trends, technological changes including energy efficiency, shifting energy fuel choices, and various policies at the national, state, and local levels. On an annual basis, the overall consumption and mix of fossil fuels in the United States fluctuates in response to changes in general economic conditions, overall energy prices, the relative price of different fuels, weather, and the availability of non-fossil alternatives.

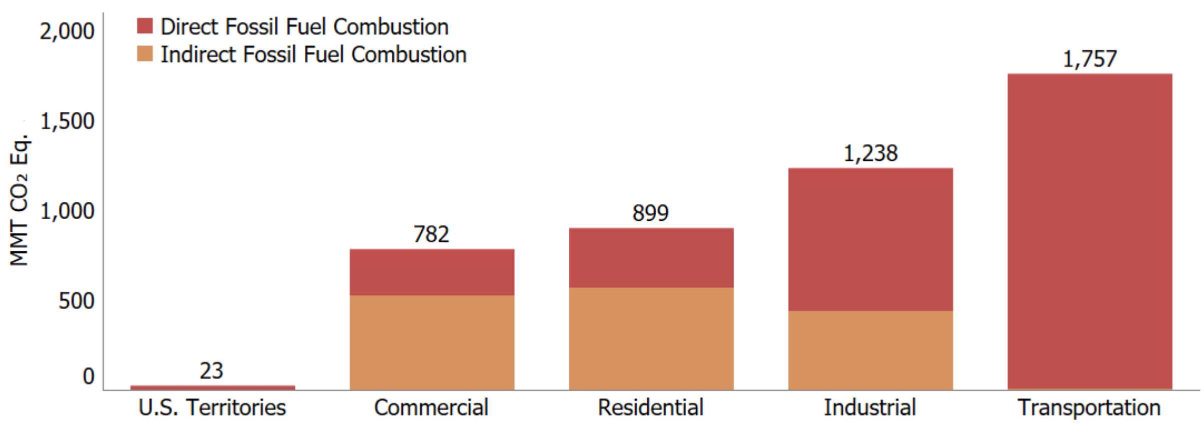
The five fuel-consuming economic sectors are transportation, electric power, industrial, residential, and commercial. Carbon dioxide emissions are produced by the electric power sector as fossil fuel is consumed to provide electricity to one of the other four "end use" sectors (see Figure 2-5). Note that this Figure reports emissions from U.S. territories as their own end-use sector due to incomplete data for their individual end-use sectors. Fossil fuel combustion for electric power also includes emissions of less than 0.5 MMT CO_2 Eq. from geothermal-based generation. Although not technically a fossil fuel, geothermal energy-related CO_2 emissions are included for reporting purposes. The source of CO_2 is non-condensable gases in subterranean heated water. Figure 2-6 further describes direct and indirect CO_2 emissions from fossil fuel combustion (electricity use), separated by end-use sector. Table 2-3 reflects the distribution of electricity generation emissions to each of the four end-use sectors on the basis of each sector's share of aggregate electricity consumption.

Figure 2-5: Trends in CO_2 from Fossil Fuel Combustion End-Use Sector Emissions and Fuel Type



Source: U.S. EPA[17]

Figure 2-6: CO_2 from Fossil Fuel Combustion End-Use Sector Emissions and Fuel Type in 2022



Source: U.S. EPA[18]

Table 2-3: Trends in CO_2 Emissions from Fossil Fuel Combustion by End-Use Sector (MMT CO_2 Eq.)

End-Use Sector	1990	2005	2018	2019	2020	2021	2022
Transportation	**1,472.0**	**1,863.3**	**1,817.9**	**1,821.4**	**1,576.9**	**1,758.6**	**1,757.4**
Combustion	1,468.9	1,858.6	1,813.1	1,816.6	1,572.8	1,753.5	1,751.3
Electricity	3.0	4.7	4.8	4.8	4.1	5.0	6.1
Industrial	**1,562.9**	**1,584.0**	**1,311.8**	**1,275.3**	**1,171.8**	**1,225.6**	**1,238.0**
Combustion	876.5	847.6	810.5	809.8	762.0	780.5	801.1
Electricity	686.4	736.3	501.3	465.5	409.8	445.1	437.0
Residential	**931.3**	**1,214.9**	**981.2**	**926.7**	**860.1**	**890.3**	**899.4**
Combustion	338.6	358.9	338.9	342.9	314.8	318.0	334.1
Electricity	592.7	856.0	642.3	583.7	545.3	572.2	565.3
Commercial	**766.0**	**1,030.1**	**851.3**	**804.4**	**709.6**	**756.1**	**782.0**
Combustion	228.3	227.1	246.3	251.7	229.3	237.5	258.7
Electricity	537.7	803.0	605.0	552.7	480.3	518.5	523.3
U.S. territories[a]	**20.0**	**51.9**	**25.9**	**24.8**	**23.3**	**23.8**	**22.6**
Total	**4,752.2**	**5,744.1**	**4,988.2**	**4,852.6**	**4,341.7**	**4,654.3**	**4,699.4**
Electric Power	**1,820.0**	**2,400.1**	**1,753.4**	**1,606.7**	**1,439.6**	**1,540.9**	**1,531.7**

[a] Fuel consumption by U.S. territories (i.e., American Samoa, Guam, Puerto Rico, U.S. Virgin Islands, Wake Island, and other outlying U.S. Pacific Islands) is included in this report.

Notes: Combustion-related emissions from electric power are allocated based on aggregate national electricity use by each end-use sector. Totals may not sum due to independent rounding.

Transportation end-use sector

Transportation activities accounted for 37.4 percent of U.S. CO_2 emissions from fossil fuel combustion in 2022, with the largest contributors being light-duty trucks (36.8 percent), followed by medium- and heavy-duty trucks (23.0 percent) and passenger vehicles (20.6 percent).

In terms of the overall trend from 1990 to 2022, total transportation CO_2 emissions increased due largely to increased demand for travel, which was a result of a confluence of factors including population growth, economic growth, urban sprawl, and low fuel prices during the beginning of this period. While an increased demand for travel has led to generally increasing CO_2 emissions since 1990, improvements in average new vehicle fuel economy since 2005 have slowed the rate of increase of CO_2 emissions. Almost all of the energy consumed by the Transportation sector is petroleum-based, including motor gasoline, diesel fuel, jet fuel, and residual oil.

Industrial end-use sector

Industrial emissions accounted for 26.3 percent of CO_2 emissions from fossil fuel combustion in 2022. These industrial emissions resulted both directly from the combustion of fossil fuels and indirectly from the generation of electricity that is used by industry.[2] Approximately 64.7 percent of these emissions resulted from direct fossil fuel combustion to produce steam and/or heat for industrial processes. The remaining emissions resulted from the use of electricity for motors, electric furnaces, ovens, lighting, and other applications. Total direct and indirect emissions from the Industrial sector have declined by 20.8 percent since 1990. This decline is due to structural changes in the U.S. economy (i.e., shifts from a manufacturing-based to a service-based economy), fuel switching, and efficiency improvements. From 2021 to 2022, total energy use in the Industrial sector increased by 1.8 percent due to an increase in total industrial production and manufacturing output.

Residential and Commercial End-Use Sectors

The Residential and Commercial end-use sectors accounted for 19.1 and 16.6 percent, respectively, of CO_2 emissions from fossil fuel combustion in 2022, including indirect emissions from electricity. The residential and commercial sectors relied heavily on electricity for meeting energy demands, with 62.9 and 66.9 percent, respectively, of their emissions attributable to electricity use for building-related activities such as lighting, heating, cooling, and operating appliances. The remaining emissions were due to the use of natural gas and petroleum for heating and cooking. Total direct and indirect emissions from the Residential sector have decreased by 3.4 percent since 1990, and total direct and indirect emissions from the Commercial sector have increased by 2.1 percent since 1990. From 2021 to 2022, an increase in heating degree days (7.9 percent) increased energy demand for heating in the Residential and Commercial sectors; also, a 4.3 percent increase in cooling degree days compared to 2021 increased demand for air conditioning in the Residential and Commercial sectors. Combined, this resulted in a 2.5 percent increase in Residential sector energy use. From 2021 to 2022, energy use in the Commercial sector increased by 4.7 percent.

Electric Power

The United States relies on electricity to meet a significant portion of its energy demands. Electricity generators used 30.5 percent of U.S. energy from fossil fuels and emitted 32.6 percent of the CO_2 from fossil fuel combustion in 2022. The type of energy source used to generate electricity, and the mix of electric generation resources used to meet demand, are the

[2] This does not include fossil fuels used as feedstocks and reductants, which are reported under IPPU emissions.

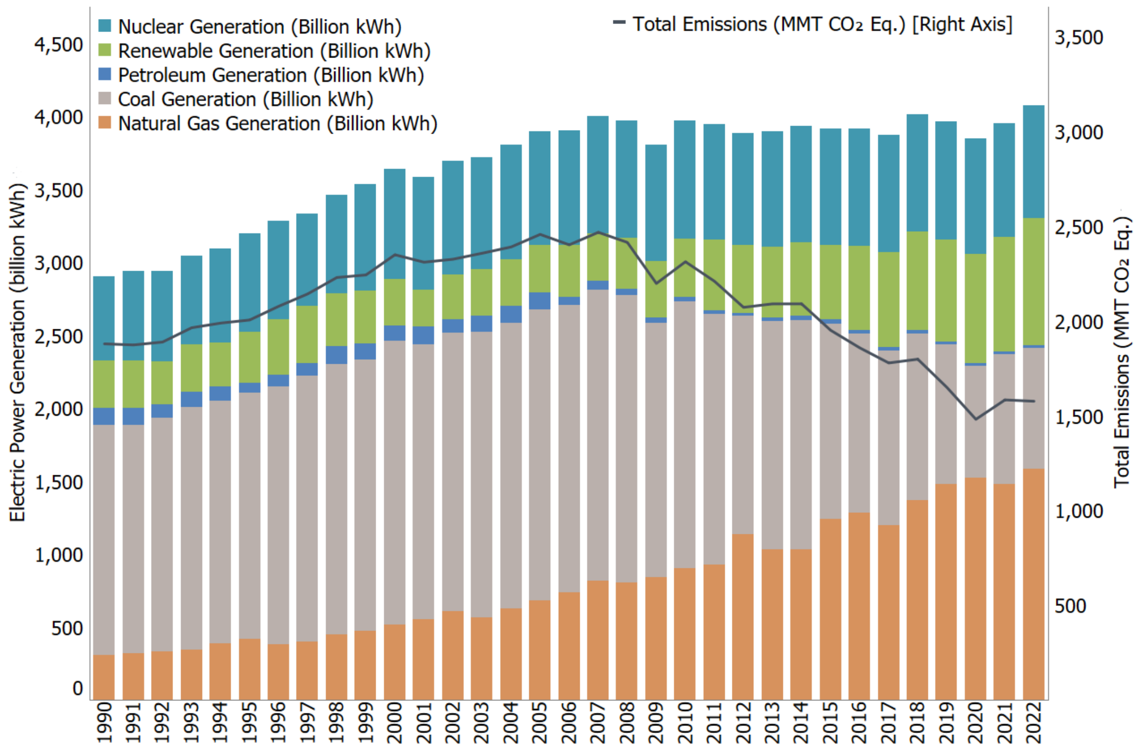
main factors influencing emissions.[3] Coal-fired electric generation (in kilowatt-hours [kWh]) decreased from 54.1 percent of generation in 1990 to 20.3 percent in 2022.[4] This corresponded with an increase in natural gas generation and non-fossil fuel renewable energy generation, largely from wind and solar energy. Natural gas generation (in kWh) represented 10.7 percent of electric power generation in 1990 and increased over the 33-year period to represent 38.8 percent of electric power generation in 2022. Wind and solar generation (in kWh) represented 0.1 percent of electric power generation in 1990 and increased over the 33-year period to represent 14.2 percent of electric power generation in 2022. Between 2021 and 2022, coal electricity generation decreased by 10.2 percent, natural gas generation increased by 4.0 percent, and renewable energy generation increased by 7.6 percent.

Overall U.S. demand for electricity has been relatively flat since 2005, due in part to a shift toward energy efficient products and more stringent energy efficiency standards for household equipment and building energy code adoption.[19] Across the time series, changes in electricity generation and the carbon intensity of fuels used for electric power have a significant impact on CO_2 emissions. While CO_2 emissions from fossil fuel combustion in the electric power sector have decreased by 15.8 percent since 1990, the carbon intensity of the electric power sector, in terms of CO_2 Eq. per QBtu input, decreased by 27.6 percent during that same timeframe. This decoupling of the level of electric power generation and the resulting CO_2 emissions is shown in Figure 2-7.

[3] In line with the reporting requirements for inventories submitted under the UNFCCC and the Paris Agreement, CO_2 emissions from biomass combustion have been estimated separately from fossil fuel CO_2 emissions and are not included in the electricity sector totals and trends discussed in this section. Net carbon fluxes from changes in biogenic carbon reservoirs are accounted for in the estimates for Land Use, Land-Use Change, and Forestry.

[4] Values represent electricity net generation from the electric power sector. See "Monthly Energy Review." U.S. Department of Energy, Energy Information Administration, February 27, 2024.

Figure 2-7: Electric Power Generation and Emissions



Source: U.S. EPA[20]

Other CO_2 Trends

Other significant CO_2 trends over this time series include the following:

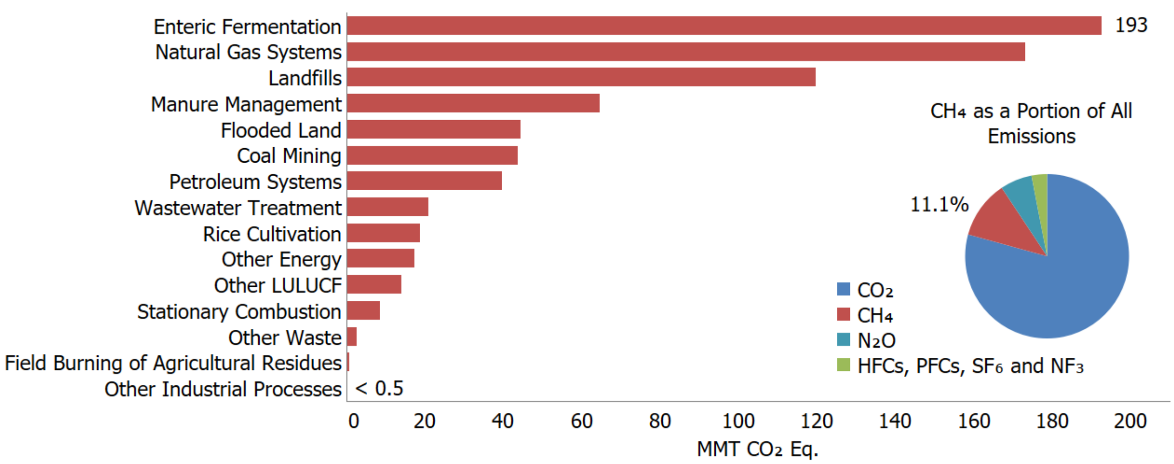
- Carbon dioxide emissions from natural gas and petroleum systems combined accounted for 1.2 percent of CO_2 emissions and 0.9 percent of total gross emissions in 2022. These emissions increased by 39.1 percent (16.4 MMT CO_2 Eq.) from 1990 to 2022. This increase is due primarily to increases in the production segment, where flaring emissions from associated gas flaring, tanks, and miscellaneous production flaring have increased over time.
- Carbon dioxide emissions from iron and steel production and metallurgical coke production accounted for 0.8 percent of CO_2 and 0.6 percent of total gross emissions. Emissions decreased by 61.2 percent (64.1 MMT CO_2 Eq.) from 1990 through 2022. This decrease was primarily due to restructuring of the industry, technological improvements, and increased scrap steel utilization.
- Total carbon stock change (i.e., net CO_2 removals) in the LULUCF sector decreased by 10.9 percent between 1990 and 2022. This decrease was primarily due to a decrease in the rate of net carbon accumulation in forest carbon stocks and cropland remaining

cropland, as well as an increase in emissions from land converted to settlements (see table 2-1 and table 2-5 of this chapter).

Methane Emissions

Methane is significantly more effective than CO_2 at trapping heat in the atmosphere: by a factor of 28 over a 100-year time frame based on the *IPCC Fifth Assessment Report* estimate. Over the last 250 years, the concentration of CH_4 in the atmosphere increased by 161.9 percent.[21] Within the United States, the main anthropogenic sources of CH_4 include enteric fermentation from domestic livestock, natural gas systems, landfills, domestic livestock manure management, flooded land, coal mining, and other energy production related activities (e.g., petroleum systems) (see Figure 2-8).

Figure 2-8: 2022 Sources of CH_4 Emissions



Source: U.S. EPA[22]

Note: "Other Energy" includes CH_4 emissions from abandoned oil and gas wells, abandoned underground coal mines, incineration of waste, and mobile combustion. "Other Waste" includes CH_4 emissions from anaerobic digestion at biogas facilities and composting. "Other Industrial Processes" includes CH_4 emissions from carbide production and consumption, ferroalloy production, iron and steel production and metallurgical coke production, and petrochemical production. "Other LULUCF" includes the CH_4 reported for peatlands remaining peatlands, forest fires, drained organic soils, grassland fires, coastal wetlands remaining coastal wetlands, and land converted to coastal wetlands.

In 2022, overall, CH_4 emissions, including LULUCF CH_4 emissions, accounted for 11.1 percent of U.S. GHG emissions, representing a decrease of 17.7 percent (164.0 MMT CO_2 Eq.) since 1990 and 2.8 percent decrease (21.8 MMT CO_2 Eq.) since 2021. Significant trends for the largest sources of U.S. CH_4 emissions include the following:

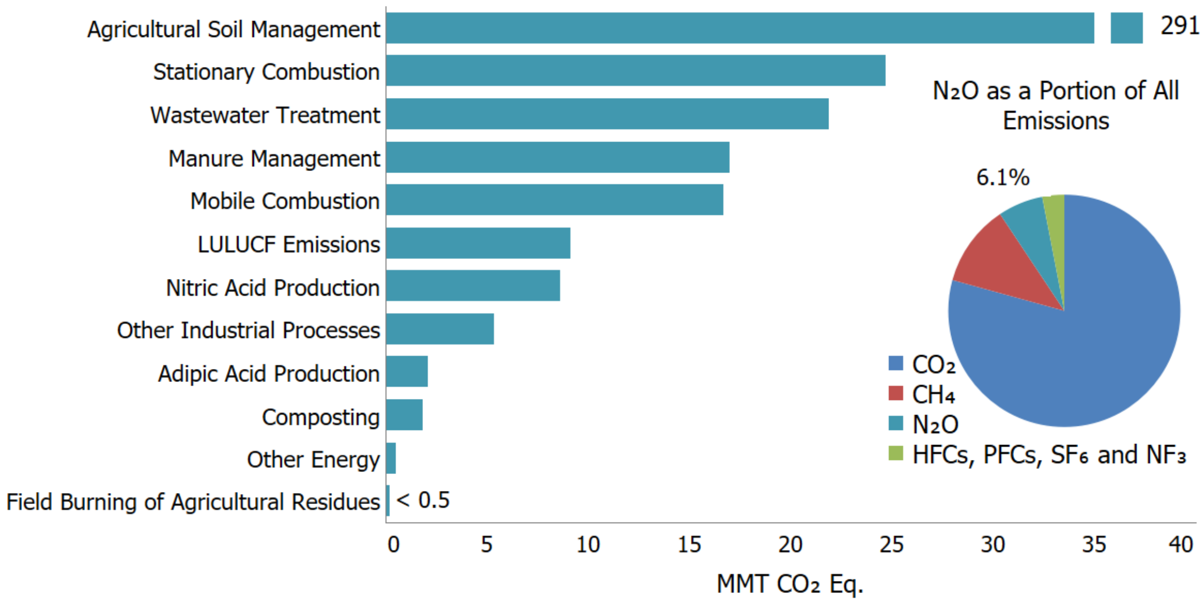
- Enteric fermentation was the largest anthropogenic source of CH_4 emissions in the United States in 2022, accounting for 27.4 percent of total CH_4 emissions and 3.0 percent of total gross emissions. Emissions have increased by 5.2 percent (9.5 MMT CO_2 Eq.) since 1990. This increase in emissions from 1990 to 2022 generally follows the increasing trends in cattle populations.
- Natural gas systems were the second largest anthropogenic source category of CH_4 emissions in the United States in 2022, accounting for 24.6 percent of total CH_4 emissions and 2.7 percent of total gross emissions. Emissions have decreased by 20.9 percent (45.7 MMT CO_2 Eq.) since 1990, largely due to decreases in emissions from distribution, transmission, and storage.
    - Landfills were the third largest anthropogenic source of CH_4 emissions in the United States in 2022, accounting for 17.1 percent of total CH_4 emissions and 1.9 percent of total gross emissions and representing a decrease of 39.4 percent (78.0 MMT CO_2 Eq.) since 1990, with small year-to-year increases. This downward trend in emissions coincided with increased landfill gas collection and control systems, and a reduction of decomposable materials (i.e., paper and paperboard, food scraps, and yard trimmings) discarded in municipal solid waste landfills over the time series.[5]

Nitrous Oxide Emissions

Nitrous oxide (N_2O) is produced by biological processes that occur in soil and water and by a variety of anthropogenic activities in the agricultural, energy, industrial, and waste management fields. While total N_2O emissions are much lower than CO_2 emissions, N_2O is nearly 265 times more powerful than CO_2 at trapping heat in the atmosphere over a 100-year time frame.[23] Since 1750, the global atmospheric concentration of N_2O has risen by approximately 24.3 percent.[24] The main anthropogenic activities producing N_2O in the United States are agricultural soil management, wastewater treatment, stationary fuel combustion, manure management, fuel combustion in motor vehicles, and nitric acid production (see Figure 2-9).

[5] Carbon dioxide emissions from landfills are not included specifically in summing waste sector totals. Net carbon fluxes from changes in biogenic carbon reservoirs and decay of disposed wood products are accounted for in the estimates for LULUCF.

Figure 2-9: 2022 Sources of N_2O Emissions



Source: U.S. EPA[25]

Note: "Other Industrial Processes" includes N_2O emissions from caprolactam, glyoxal, and glyoxylic acid production; the electronics industry; and product uses. "Other Energy" includes N_2O emissions from petroleum systems, natural gas systems, and incineration of waste. LULUCF emissions include N_2O emissions reported for peatlands remaining peatlands, forest fires, drained organic soils, grassland fires, coastal wetlands remaining coastal wetlands, forest soils, and settlement soils.

Significant trends for the largest sources of U.S. emissions of N_2O include the following:

- Agricultural soils were the largest anthropogenic source of N_2O emissions in 2022, accounting for 74.6 percent of N_2O emissions and 4.6 percent of total gross greenhouse gas emissions in the United States. These emissions increased by 0.7 percent (2.0 MMT CO_2 Eq.) from 1990 to 2022 but fluctuated during that period due to annual variations in weather patterns, fertilizer use, and crop production.
- Stationary combustion was the second largest source of anthropogenic N_2O emissions in 2022, accounting for 6.3 percent of N_2O emissions and 0.4 percent of total gross U.S. greenhouse gas emissions in 2022. Stationary combustion emissions peaked in 2007 and steadily decreased until 2020. Emissions increased in 2021 and 2022. Stationary combustion emissions have increased by 10.6 percent (2.4 MMT CO_2 Eq.) since 1990.
- Wastewater treatment, both domestic and industrial, was the third largest anthropogenic source of N_2O emissions in 2022, accounting for 5.6 percent of N_2O emissions and 0.3 percent of total gross greenhouse gas emissions in the United States in 2022. Emissions from wastewater treatment increased by 48.2 percent (7.1 MMT CO_2 Eq.) since 1990 as a result of growing U.S. population and protein consumption.

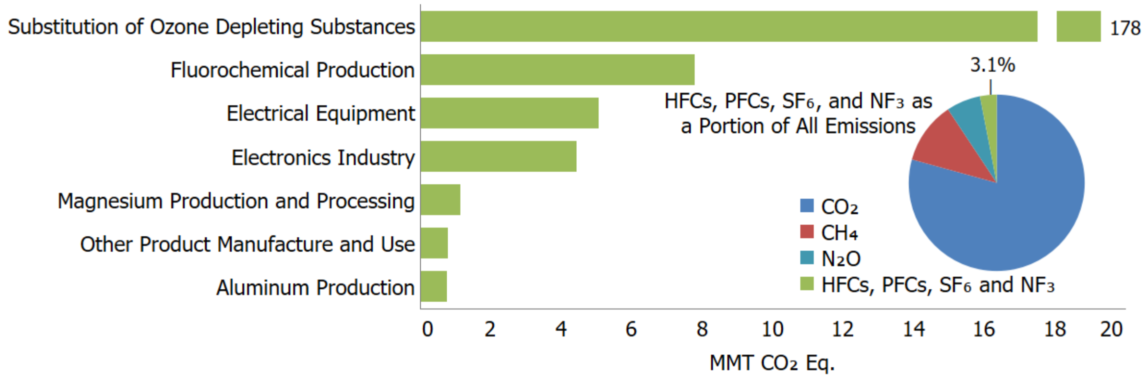
HFC, PFC, SF_6, and NF_3 Emissions

HFCs, PFCs, SF_6, and NF_3 are potent GHGs. In addition to having very high global warming potentials, SF_6 and PFCs have extremely long atmospheric lifetimes, resulting in their essentially irreversible accumulation in the atmosphere once emitted. Sulfur hexafluoride is the most potent greenhouse gas the IPCC has evaluated.[26]

HFCs are synthetic chemicals that are used as alternatives to ozone depleting substances (ODS), which are being phased out under the Montreal Protocol on Substances that Deplete the Ozone Layer, and the Clean Air Act Amendments of 1990. The most common HFCs are, however, powerful GHGs. Currently, they have a small aggregate radiative forcing impact, but it is anticipated that without further controls their contribution to overall radiative forcing will increase.[27] Under the 2016 Kigali Amendment to the Montreal Protocol, there is now an international effort to phase down HFCs. The United States ratified the Kigali Amendment on October 31, 2022. The United States enacted the American Innovation and Manufacturing (AIM) Act on December 27, 2020, which gives EPA authority to phase down HFC production and consumption in line with the Kigali Amendment phase-down schedule through an allowance allocation program, promulgate certain regulations for purposes of maximizing reclamation and minimizing releases of HFCs and their substitutes from equipment, and facilitate transitions to next-generation technologies through sector-based restrictions on HFCs. Additional information is available in Chapter 3.

PFCs are emitted from the production of electronics and aluminum and also (in smaller quantities) from their use as alternatives to ODS. SF_6 is emitted from the production of electronics and magnesium, as well as from the manufacturing and use of electrical transmission and distribution equipment. NF_3 is also emitted from electronics production. HFCs are also emitted during production of HCFC-22 and electronics (see Figure 2-10).

Figure 2-10: 2022 Sources of HFCs, PFCs, SF_6, and NF_3 Emissions



Source: U.S. EPA[28]

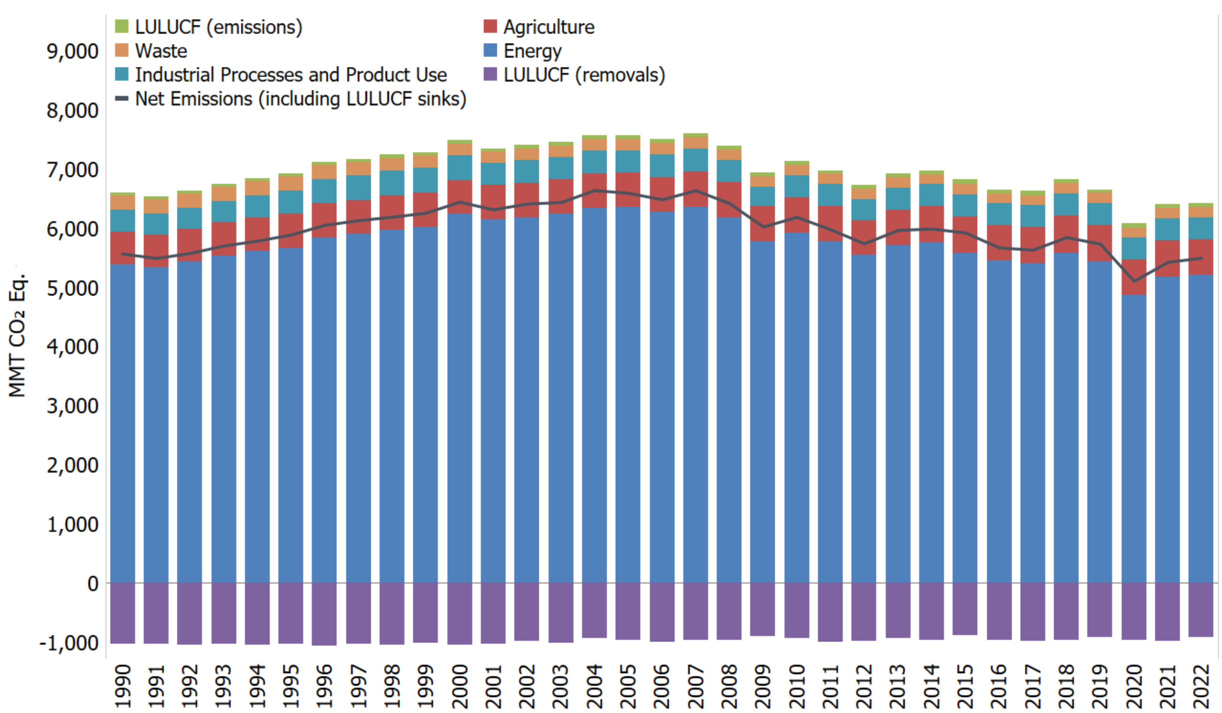
Some significant trends for the largest sources of U.S. HFC, PFC, SF_6, and NF_3 emissions include the following:

- HFC and PFC emissions resulting from their use as substitutes for ODS (e.g., chlorofluorocarbons [CFCs]) are the largest share of fluorinated emissions (89.9 percent) in 2022 and have been consistently increasing, from small amounts since 1990. This increase over the time series was largely the result of efforts to phase out CFCs and other ODS in the United States.
- SF_6 emissions from electrical equipment decreased by 79.4 percent (19.6 MMT CO_2 Eq.) from 1990 to 2022. There are two factors contributing to this decrease: (1) a sharp increase in the price of SF_6 during the 1990s and (2) a growing awareness of the environmental impact of SF_6 emissions through programs such as EPA's SF_6 Emission Reduction Partnership for Electric Power Systems.
- HFC, PFC, SF_6, and NF_3 emissions from fluorochemical production decreased by 89.0 percent (63.2 MMT CO_2 Eq.) from 1990 to 2022 due to a reduction in the HFC-23 emission rate from HCFC-22 production (kg HFC-23 emitted/kg HCFC-22 produced), the imposition of emissions controls at production facilities, and a decrease in SF_6 production (due to the cessation of production at the major SF_6 production facility in 2010).
- PFC emissions from aluminum production decreased by 96.1 percent (18.5 MMT CO_2 Eq.) from 1990 to 2022, due to both industry emission reduction efforts and lower domestic aluminum production.

Overview of UNFCCC/IPCC Sector Emissions and Trends

Figure 2-11 and Table 2-4 show aggregate emissions and sinks by the sectors defined by the UNFCCC and Paris Agreement reporting guidelines and methodological framework in the IPCC guidelines to promote comparability across countries. Over the 33-year period of 1990 to 2022, total emissions from the Energy and Waste sectors decreased by 3.4 percent (181.2 MMT CO_2 Eq.) and 29.3 percent (69.1 MMT CO_2 Eq.) respectively. Emissions from the Industrial Processes and Product Use and Agriculture sectors grew by 3.9 percent (14.4 MMT CO_2 Eq.), and 7.7 percent (42.2 MMT CO_2 Eq.), respectively. Over the same period, the overall net flux from LULUCF (i.e., the net sum of all CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes in units of MMT CO_2 Eq.) decreased by 12.5 percent (122.5 MMT CO_2 Eq.) and resulted in a removal of 854.2 MMT CO_2 Eq. in 2022.

Figure 2-11: U.S. Greenhouse Gas Emissions and Sinks by Sector



Source: U.S. EPA[29]

Table 2-4: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks by Sector (MMT CO_2 Eq.)

UNFCCC/IPCC Sector	1990	2005	2018	2019	2020	2021	2022	Percent Change Since 1990
Energy	5,381.0	6,349.5	5,570.0	5,422.4	4,862.6	5,173.3	5,199.8	-3.4%
Industrial Processes and Product Use	368.8	371.3	367.2	371.9	367.9	381.6	383.2	3.9%
Agriculture	551.1	581.8	642.4	620.1	599.7	604.8	593.4	7.7%
Waste	235.9	192.0	173.2	175.8	171.7	169.2	166.9	-29.3%
Total Gross Emissions[a] (Sources)	**6,536.9**	**7,494.6**	**6,752.7**	**6,590.1**	**6,001.8**	**6,328.8**	**6,343.2**	**-3.0%**
LULUCF Sector Net Total[b]	(976.7)	(907.7)	(915.5)	(863.6)	(904.4)	(910.6)	(854.2)	-12.5%
Net Emissions (Sources and Sinks)[c]	**5,560.2**	**6,586.9**	**5,837.3**	**5,726.6**	**5,097.4**	**5,418.2**	**5,489.0**	**-1.3%**

[a] Total emissions without LULUCF.

[b] The LULUCF sector net total is the sum of all LULUCF CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes in units of MMT CO_2 Eq.

[c] Net emissions with LULUCF.

Notes: Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Energy

The energy sector includes emissions of all GHGs resulting from stationary and mobile energy activities, including fuel combustion and fugitive fuel emissions and the use of fossil fuels for non-energy purposes. As noted above, energy-related activities, primarily fossil fuel combustion, accounted for the vast majority of U.S. CO_2 emissions for the period of 1990 through 2022. Energy-related activities are also partly responsible for CH_4 and N_2O emissions (40.2 percent and 10.8 percent of total U.S. emissions of each gas, respectively). Overall, emission sources in the energy sector account for a combined 82 percent of gross total U.S. GHG emissions in 2022.

Industrial Process and Product Use

The industrial processes and product use (IPPU) sector includes GHG emissions generated and emitted as the byproducts of non-energy-related industrial processes, which involve the chemical or physical transformation of raw materials and can release gases such as CO_2, CH_4, N_2O, and fluorinated emissions (e.g., HFC-23). These processes include iron and steel production and metallurgical coke production, cement production, petrochemical production, ammonia production, lime production, other process uses of carbonates (e.g., other uses of carbonates, other uses of soda ash not associated with glass manufacturing, ceramics production, and non-metallurgical magnesia production), nitric acid production, adipic acid production, urea consumption for nonagricultural purposes, aluminum production, HCFC-22 production, other fluorochemical production, glass production, soda ash production, ferroalloy production, titanium dioxide production, caprolactam production, zinc production, phosphoric acid production, lead production, and silicon carbide production and consumption. Most of these industries also emit CO_2 from fossil fuel combustion which, in line with IPCC sectoral definitions, is included in the Energy Sector.

This sector also includes the release of HFCs, PFCs, SF_6, and NF_3 and other fluorinated compounds used in industrial manufacturing processes and by end-consumers (e.g., residential and mobile air conditioning). These industries include electronics manufacturing, electric power transmission and distribution, and magnesium metal production and processing. In addition, N_2O is used in and emitted by electronics industry and anesthetic and aerosol applications, PFCs and SF_6 are emitted in other product use, and CO_2 is consumed and emitted through various end-use applications. In 2022, emissions resulting from use of the substitution of ODS (e.g., CFCs) by end-consumers was the largest source of IPPU emissions and accounted for 46.5 percent of total IPPU emissions.

IPPU activities are responsible for 3.3, less than 0.5, and 4.1 percent of total U.S. CO_2, CH_4, and N_2O emissions respectively, as well as for all U.S. emissions of fluorinated gases such as HFCs, PFCs, SF_6, and NF_3. Overall, emission sources in the IPPU sector accounted for 6 percent of U.S. GHG gas emissions in 2022. IPPU emissions have increased by 0.4 percent (1.6 MMT CO_2 Eq.) since 2021 and by 3.9 percent (14.4 MMT CO_2 Eq.) since 1990, mostly due to increased use of ODS substitutes (e.g., HFCs).

Agriculture

The agriculture sector includes anthropogenic emissions from agricultural activities (except fuel combustion, which per IPCC guidelines is addressed in the Energy sector, and some agricultural CO_2, CH_4, and N_2O fluxes, which per IPCC guidance are addressed in the Land Use, Land-Use Change, and Forestry sector). Agricultural activities contribute directly to emissions of GHGs through a variety of processes, including the following source categories: agricultural soil management, enteric fermentation in domestic livestock, livestock manure management, rice cultivation, urea fertilization, liming, and field burning of agricultural residues.

In 2022, agricultural activities were responsible for 9.4 percent of total gross U.S. greenhouse gas emissions. Agriculture sector emissions decreased by 11.4 MMT CO_2 Eq. (1.9 percent) since 2021 and have increased by 42.2 MMT CO_2 Eq. (7.7 percent) since 1990, mostly from trends in enteric fermentation and manure management. Methane, N_2O, and CO_2 are greenhouse gases emitted by agricultural activities. Methane emissions from enteric fermentation and manure management represented 36.6 percent of total CH_4 emissions from anthropogenic activities in 2022. Agricultural soil management activities, such as application of synthetic and organic fertilizers, deposition of livestock manure, and growing N-fixing plants, were the largest contributors to U.S. N_2O emissions in 2022, accounting for 74.6 percent of total N_2O emissions. Carbon dioxide emissions from the application of crushed limestone and dolomite (i.e., soil liming) and urea fertilization represented 0.2 percent of total CO_2 emissions from anthropogenic activities.

Land Use, Land Use Change, and Forestry

The LULUCF sector includes emissions and removals of CO_2 and emissions of CH_4 and N_2O from managed lands in the United States. Consistent with the *2006 IPCC Guidelines*, emissions and removals from managed lands are considered to be anthropogenic, while emissions and removals from unmanaged lands are considered to be natural. The share of managed land in the United States is approximately 95 percent of total land included in the NID. More information on the definition of managed land used is provided in Chapter 6 of the NID.

Overall, the NID results show that U.S. managed land is a net sink for CO_2 (i.e., provides net carbon sequestration). The primary drivers of fluxes on managed lands include forest management practices, tree planting in urban areas, the management of agricultural soils, and land use change. The main drivers for forest carbon sequestration include forest growth and increasing forest area (i.e., afforestation), as well as a net accumulation of carbon stocks in harvested wood pools. The net sequestration in *Settlements Remaining Settlements,* which occurs predominantly from urban forests (i.e., Settlement Trees) and landfilled yard trimmings and food scraps, is a result of net tree growth and increased urban forest area, as well as long-term accumulation of yard trimmings and food scraps carbon in landfills.

The LULUCF sector in 2022 resulted in a net increase in carbon stocks (i.e., net CO_2 removals) of 921.8 CO_2 Eq.[6] The removals of carbon offset 14.5 percent of total gross greenhouse gas emissions in 2022. Emissions of CH_4 and N_2O from LULUCF activities in 2022 represented 1.2 percent of net greenhouse gas emissions.[7] Carbon dioxide removals from carbon stock changes are presented in Table 2-5 along with CH_4 and N_2O emissions for LULUCF source categories. Between 1990 and 2022, total carbon sequestration in the LULUCF sector decreased by 10.9 percent, primarily due to a decrease in the rate of net carbon accumulation in forests and in cropland remaining cropland, as well as an increase in CO_2 emissions from land converted to

[6] LULUCF carbon stock change is the net C stock change from the following categories: forest land remaining forest land, land converted to forest land, cropland remaining cropland, land converted to cropland, grassland remaining grassland, land converted to grassland, wetlands remaining wetlands, land converted to wetlands, settlements remaining settlements, and land converted to settlements.

[7] LULUCF emissions include the CH_4 and N_2O emissions reported for peatlands remaining peatlands, forest fires, drained organic soils, grassland fires, and coastal wetlands remaining coastal wetlands; CH_4 emissions from land converted to coastal wetlands; and N_2O emissions from forest soils and settlement soils

settlements. The overall net flux from LULUCF (i.e., net sum of all CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes in units of MMT CO_2 Eq.) resulted in a removal of 854.2 MMT CO_2 Eq. in 2022.

Flooded lands were the largest source of CH_4 emissions from the LULUCF sector and the fifth largest source overall net CH_4 emissions in 2022. Forest fires were the second largest source of CH_4 emissions, followed by coastal wetlands remaining coastal wetlands. Forest fires were the largest source of N_2O emissions from the LULUCF sector in 2022.

Table 2-5: U.S. Greenhouse Gas Emissions and Removals (Net Flux) from Land Use, Land-Use Change, and Forestry (MMT CO_2 Eq.)

Land-Use Category	1990	2005	2018	2019	2020	2021	2022
Forest Land Remaining Forest Land[a]	(968.8)	(860.1)	(863.4)	(807.0)	(846.3)	(823.9)	(771.7)
Land Converted to Forest Land[b]	(100.2)	(100.2)	(100.4)	(100.3)	(100.3)	(100.3)	(100.3)
Cropland Remaining Cropland	(5.0)	(31.6)	(17.8)	(19.4)	(8.8)	(32.0)	(31.7)
Land Converted to Cropland[c]	45.4	34.5	31.9	31.4	29.3	34.9	35.1
Grassland Remaining Grassland[d]	24.6	24.9	29.7	28.9	17.1	11.5	14.0
Land Converted to Grassland[c]	35.3	21.8	25.2	25.4	28.7	24.5	25.6
Wetlands Remaining Wetlands[e]	36.8	39.4	38.2	38.1	38.1	38.1	38.1
Land Converted to Wetlands[e]	7.2	1.8	0.7	0.7	0.7	0.7	0.7
Settlements Remaining Settlements[f]	(109.1)	(115.2)	(131.0)	(131.5)	(131.8)	(132.3)	(132.3)
Land Converted to Settlements[c]	57.2	77.1	71.4	70.2	68.8	68.2	68.2
LULUCF Carbon Stock Change[g]	**(1,034.7)**	**(976.6)**	**(978.3)**	**(921.6)**	**(972.8)**	**(983.4)**	**(921.8)**
LULUCF Emissions[h]	**58.0**	**68.9**	**62.8**	**58.0**	**68.4**	**72.9**	**67.6**
CH_4	53.1	58.5	55.5	52.5	59.3	62.1	58.4
N_2O	4.8	10.3	7.3	5.5	9.1	10.7	9.1
LULUCF Sector Net Total[i]	**(976.7)**	**(907.7)**	**(915.5)**	**(863.6)**	**(904.4)**	**(910.6)**	**(854.2)**

[a] Includes the net changes to carbon stocks stored in all forest ecosystem pools and harvested wood products, emissions from fires on both forest land remaining forest land and land converted to forest land, emissions from N fertilizer additions on both forest land remaining forest land and land converted to forest land, and CH_4 and N_2O emissions from drained organic soils on both forest land remaining forest land and land converted to forest land.

[b] Includes the net changes to carbon stocks stored in all forest ecosystem pools.

[c] Includes changes in mineral and organic soil carbon stocks for all land use conversions to cropland, grassland, and settlements, respectively. Also includes aboveground/belowground biomass, dead wood, and litter carbon stock changes for conversion of forest land to cropland, grassland, and settlements, respectively.

[d] Estimates include CH_4 and N_2O emissions from fires on both grassland remaining grassland and land converted to grassland.

[e] Estimates include CH_4 emissions from flooded land remaining flooded land and land converted to flooded land.

[f] Estimates include N_2O emissions from N fertilizer additions on both settlements remaining settlements and land converted to settlements because it is not possible to separate the activity data at this time.

[g] LULUCF carbon stock change includes any carbon stock gains and losses from all land use and land use conversion categories.

[h] LULUCF emissions subtotal includes the CH_4 and N_2O emissions reported for peatlands remaining peatlands, forest fires, drained organic soils, grassland fires, and coastal wetlands remaining coastal wetlands; CH_4 emissions from land converted to coastal wetlands, flooded land remaining flooded land, and land converted to flooded land; and N_2O emissions from forest soils and settlement soils. Emissions values are included in land-use category rows.

[i] The LULUCF sector net total is the net sum of all LULUCF CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes in units of MMT CO_2 Eq.

Notes: Totals may not sum due to independent rounding. Parentheses indicate net sequestration.

Waste

The waste sector includes emissions from waste management activities (except incineration of waste, which is addressed in the Energy sector). Landfills were the largest source of anthropogenic greenhouse gas emissions from waste management activities, accounting for 71.8 percent of total greenhouse gas emissions from waste management activities, and 17.1 percent of total U.S. CH_4 emissions.[8]

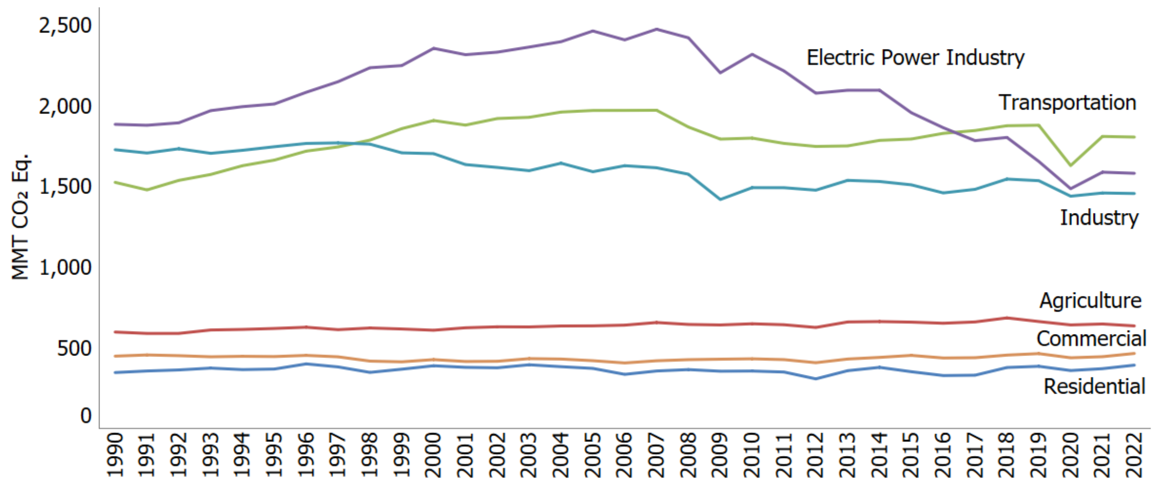
Additionally, wastewater treatment accounted for 25.6 percent of total waste sector greenhouse gas emissions, 3.0 percent of U.S. CH_4 emissions, and 5.6 percent of U.S. N_2O emissions in 2022. Emissions of CH_4 and N_2O from commercial composting are also included in this chapter, accounting for 1.5 percent (2.6 MMT CO_2 Eq.) and 1.1 percent (1.8 MMT CO_2 Eq.) of overall waste sector emissions, respectively. Anaerobic digestion at biogas facilities generated CH_4 emissions, accounting for less than 0.05 percent of emissions from the Waste sector. Overall, emission sources in the waste sector accounted for 2.6 percent of total gross U.S. greenhouse gas emissions in 2022. Waste sector emissions decreased by 1.4 percent (2.3 MMT CO_2 Eq.) since 2021 and by 29.3 percent (69.1 MMT CO_2 Eq.) since 1990.

Emissions by Economic Sector

In addition to the Paris Agreement and UNFCCC reporting sectors and methods defined by the IPCC, this report also characterizes emissions according to commonly used economic sector categories: Residential, Commercial, Industry, Transportation, Electric power, and Agriculture. Emissions from U.S. territories are reported as their own end-use sector due to a lack of specific consumption data for the individual end-use sectors within U.S. territories. For more information on trends in the LULUCF sector, see discussion above on LULUCF sector emission and removal trends. In 2022, transportation accounted for the largest percentage (28.4 percent) of U.S. GHG emissions, electricity generation activities accounted for the second largest percentage (24.9 percent), and industry accounted for the third largest percentage (22.9 percent) (see Figure 2-12). As seen in Table 2-6, U.S. GHG emissions from some major economic sectors (e.g., Electric Power and Industry sectors) decreased since 1990, while others have increased (e.g., Transportation). The long-term decline in these emissions has been due to structural changes in the U.S. economy, fuel switching, and energy efficiency improvements.

[8] Landfills also store carbon, due to incomplete degradation of organic materials such as harvest wood products, yard trimmings, and food scraps, as described in the Land Use, Land-Use Change, and Forestry chapter of the Inventory report. Also, the estimated total methane emissions used to estimate contribution excludes methane emissions from the LULUCF sector.

Figure 2-12: U.S. Greenhouse Gas Emissions Allocated to Economic Sectors



Source: U.S.EPA[30]

Note: Figure above excludes emissions and removals from Land Use, Land-Use Change, and Forestry and emissions from U.S. territories.

Table 2-6: U.S. Greenhouse Gas Emissions Allocated to Economic Sectors (MMT CO_2 Eq.)

Economic Sectors	1990	2005	2018	2019	2020	2021	2022	Percent Change Since 1990
Transportation	1,521.4	1,965.9	1,871.6	1,874.6	1,625.3	1,805.5	1,801.5	18.4%
Electric Power Industry	1,880.2	2,457.4	1,799.2	1,650.8	1,482.2	1,584.4	1,577.5	-16.1%
Industry	1,723.3	1,587.3	1,541.9	1,531.8	1,435.9	1,455.8	1,452.5	-15.7%
Agriculture	595.9	634.3	683.5	661.0	640.0	645.9	634.0	6.4%
Commercial	447.0	418.9	453.5	462.6	436.9	443.7	463.7	3.7%
Residential	345.6	371.2	376.8	384.2	358.0	369.6	391.3	13.2%
U.S. territories	23.4	59.7	26.3	25.1	23.4	23.9	22.7	-3.1%
Total Gross Emissions (Sources)	**6,536.9**	**7,494.6**	**6,752.7**	**6,590.1**	**6,001.8**	**6,328.8**	**6,343.2**	**-3.0%**
LULUCF Sector Net Total[a]	(976.7)	(907.7)	(915.5)	(863.6)	(904.4)	(910.6)	(854.2)	-12.5%
Net Emissions (Sources and Sinks)	**5,560.2**	**6,586.9**	**5,837.3**	**5,726.6**	**5,097.4**	**5,418.2**	**5,489.0**	**-1.3%**

[a] The LULUCF sector net total is the net sum of all LULUCF CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes.

Notes: Total (gross) emissions are presented without LULUCF. Total net emissions are presented with LULUCF. Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Using this categorization, emissions from transportation activities accounted for the largest portion (28.4 percent) of total gross U.S. greenhouse gas emissions in 2022. The Electric Power Industry sector accounted for the second largest portion (24.9 percent) of U.S. greenhouse gas emissions in 2022, while emissions from Industry accounted for the third largest portion (22.9 percent). Emissions from Industry have in general declined over the past decade, due to a number of factors, including structural changes in the U.S. economy (i.e., shifts from a manufacturing-based to a service-based economy), fuel switching, and energy efficiency improvements.

The remaining 23.8 percent of U.S. greenhouse gas emissions were contributed by, in order of magnitude, the Agriculture, Commercial, and Residential sectors, plus emissions from U.S. territories. Activities related to Agriculture accounted for 10.0 percent of U.S. emissions; unlike other economic sectors, Agricultural sector emissions were dominated by N_2O emissions from agricultural soil management and CH_4 emissions from enteric fermentation. An increasing amount of carbon is stored in agricultural soils each year, but this CO_2 sequestration is assigned to the LULUCF sector rather than the Agriculture economic sector. The Commercial and Residential sectors accounted for 7.3 percent and 6.2 percent of emissions, respectively, and U.S. territories accounted for 0.4 percent of emissions; emissions from these sectors primarily consisted of CO_2 emissions from fossil fuel combustion. Carbon dioxide was also emitted and sequestered by a variety of activities related to forest management practices, tree planting in urban areas, the management of agricultural soils, landfilling of yard trimmings, and changes in carbon stocks in coastal wetlands.

Electricity is ultimately used in the economic sectors described above. Table 2-7 presents greenhouse gas emissions from economic sectors with emissions related to electric power distributed into end-use categories (i.e., emissions from electric power generation are allocated to the economic sectors in which the electricity is used). To distribute electricity emissions among end-use sectors, emissions from the source categories assigned to electric power were allocated to the Residential, Commercial, Industry, Transportation, and Agriculture economic sectors according to retail sales of electricity for each end-use sector.[31] These source categories include CO_2 from fossil fuel combustion and the use of limestone and dolomite for flue gas desulfurization, CO_2 and N_2O from incineration of waste, CH_4 and N_2O from stationary sources, and SF_6 from electrical equipment systems.

When emissions from electricity use are distributed among these end-use sectors, industrial activities and transportation account for the largest shares of U.S. greenhouse gas emissions (29.5 percent and 28.5 percent, respectively) in 2022. The Commercial and Residential sectors contributed the next largest shares of total gross U.S. greenhouse gas emissions in 2022 (15.8 and 15.3 percent, respectively). Emissions from the Commercial and Residential sectors increase substantially when emissions from electricity use are included, due to their relatively large share of electricity use for energy (e.g., lighting, cooling, appliances).

Table 2-7: U.S. Greenhouse Gas Emissions by Economic Sector with Electricity-Related Emissions Distributed (MMT CO_2 Eq.)

Economic Sectors	1990	2005	2018	2019	2020	2021	2022	Percent Change Since 1990
Industry	2,397.3	2,302.9	2,017.1	1,974.8	1,823.5	1,877.8	1,872.9	-21.9%
Transportation	1,524.6	1,970.8	1,876.5	1,879.5	1,629.5	1,810.6	1,807.8	18.6%
Commercial	1,002.5	1,241.1	1,074.3	1,030.5	931.5	976.8	1,002.6	0.0%
Residential	958.0	1,247.7	1,035.9	984.0	919.5	958.0	973.5	1.6%
Agriculture	631.1	672.6	722.7	696.3	674.4	681.6	663.6	5.2%
U.S. territories	23.4	59.7	26.3	25.1	23.4	23.9	22.7	-3.1%
Total Gross Emissions (Sources)	**6,536.9**	**7,494.6**	**6,752.7**	**6,590.1**	**6,001.8**	**6,328.8**	**6,343.2**	**-3.0%**
LULUCF Sector Net Total[a]	(976.7)	(907.7)	(915.5)	(863.6)	(904.4)	(910.6)	(854.2)	-12.5%
Net Emissions (Sources and Sinks)	**5,560.2**	**6,586.9**	**5,837.3**	**5,726.6**	**5,097.4**	**5,418.2**	**5,489.0**	**-1.3%**

[a] The LULUCF sector net total is the net sum of all LULUCF CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes.

Notes: Emissions from electric power are allocated based on aggregate electricity use in each end-use sector. Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Box 2-2: Trends in U.S. Greenhouse Gas Emissions and Other Key Indices

Total (gross) greenhouse gas emissions can be compared to other economic and social indices to highlight changes over time. These comparisons include: (1) aggregate energy use, because energy-related activities are the largest sources of emissions; (2) energy use per capita as a measure of efficiency; (3) emissions per unit of total gross domestic product as a measure of national economic activity; and (4) emissions per capita.

Table 2-8 provides data on various statistics related to U.S. greenhouse gas emissions normalized to 1990 as a baseline year. These values represent the relative change in each statistic since 1990. Greenhouse gas emissions in the United States have decreased at an average annual rate of 0.1 percent since 1990, although changes from year to year have been significantly larger. This growth rate is slightly slower than that for total energy use, overall gross domestic product (GDP) and national population (see Figure 2-13). The direction of these trends started to change after 2005, when greenhouse gas emissions, total energy use and associated fossil fuel consumption began to peak. Greenhouse gas emissions in the United States have decreased at an average annual rate of 0.9 percent since 2005. Since 2005, GDP and national population generally continued to increase, and energy use has decreased slightly, noting 2020 was impacted by the COVID-19 pandemic.

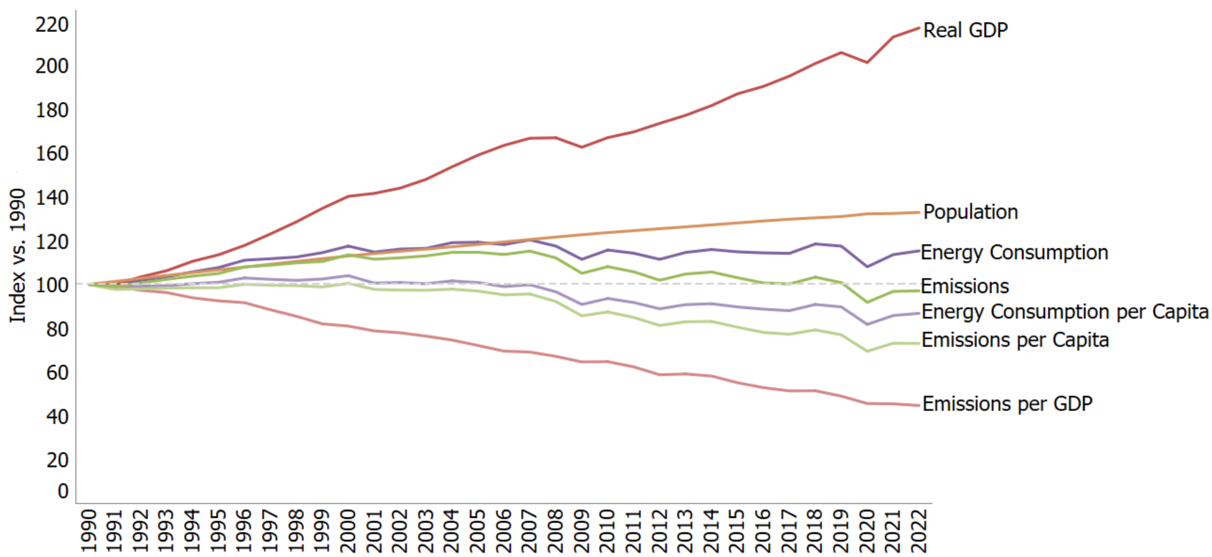
Table 2-8: Recent Trends in U.S. Greenhouse Gas Emissions and Other Key Indices

(Index 1990 = 100)

Variable	1990	2005	2018	2019	2020	2021	2022	Avg. Annual Growth Rate Since 1990[a]	Avg. Annual Growth Rate Since 2005[a]
Greenhouse Gas Emissions[b]	100	115	103	101	92	97	97	-0.1%	-0.9%
Energy Use[c]	100	119	118	117	107	113	115	0.5%	-0.2%
GDP[d]	100	159	201	206	201	213	217	2.5%	1.9%
Population[e]	100	118	130	131	132	132	133	0.9%	0.7%

+ Absolute value does not exceed 0.05 percent.
[a] Average annual growth rate.
[b] Gross total GWP-weighted values.
[c] Energy content-weighted values (EIA 2024).
[d] GDP in chained 2017 dollars (BEA 2024).
[e] U.S. Census Bureau (2024).

Figure 2-13: U.S. Greenhouse Gas Emissions Per Capita and Per Dollar of Gross Domestic Product (GDP)



Source: U.S. EPA,[32] U.S. Bureau of Economic Analysis (BEA), U.S. Census Bureau[33]

[1] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pg. 1-1).

[2] "Annex - Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement", Conference of the Parties serving as the meeting of the Parties to the Paris Agreement, March 19, 2019. Annex to Decision 18/CMA.1 (Pg. 23, para. 20-24).

[3] IPCC 2014, 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, Hiraishi, T., Krug, T., Tanabe, K., Srivastava, N., Baasansuren, J., Fukuda, M. and Troxler, T.G. (eds). Published: IPCC, Switzerland.

[4] IPCC 2019, 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Calvo Buendia, E., Tanabe, K., Kranjc, A., Baasansuren, J., Fukuda, M., Ngarize, S., Osako, A., Pyrozhenko, Y., Shermanau, P. and Federici, S. (eds). Published: IPCC, Switzerland.

[5] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pgs. 1-11 to 1-12).

[6] "2022 U.S. Climate Ambition Report, Eighth National Communication and Fifth Biennial Report to the United Nations Framework Convention on Climate Change." U.S. Department of State, December 2022. https://unfccc.int/sites/default/files/resource/US%202022%20NC8-BR5.pdf.

[7] IPCC (2021) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2391 pp. doi:10.1017/9781009157896.

[8] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pgs. 2-2).

[9] Ibid.Pg.2-2.

[10] Ibid, Pg.2-3.

[11] IPCC (2021) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2391 pp. doi:10.1017/9781009157896.; "Trends in Atmospheric Carbon Dioxide." NOAA/ESRL, Accessed January 2024. https://gml.noaa.gov/ccgg/trends/.

[12] "Energy related CO2 emissions, 2022, International Energy Agency, 2022. https://www.iea.org/reports/co2-emissions-in-2022

[13] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pg.ES-9).

[14] See decision 18/CM.1, annex, paragraph 37.

[15] See decision 7/CP.27, paragraphs 1 and 2.

[16] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022, Annex 6: Additional Information." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pg. A-505).

[17] Ibid, Pg., 2-15.

[18] Ibid, Pg. ES-10.

[19] "Electric Power Monthly, Table 5.1 Sales of Electricity to Ultimate Customers: Total by End-Use Sector: 2014-July 2024" U.S. Department of Energy, U.S. Energy Information Administration, September 24, 2024. https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=table_5_01.; "Energy Efficiency in the United States: 35 Years and Counting" American Council for an Energy-Efficient Economy, June 2015. (Pgs. iv-vi, 1-5);

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[21] IPCC (2021) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2391 pp. doi:10.1017/9781009157896.; "Trends in Atmospheric Methane." NOAA/ESRL, Accessed January 2024. https://gml.noaa.gov/ccgg/trends_ch4/.
[22] Ibid, Pg. ES-13.
[23] Nitrous Oxide (N_2O) hemispheric and global monthly means from the NOAA/ESRL Chromatograph for Atmospheric Trace Species data from baseline observatories (Barrow, Alaska; Summit, Greenland; Niwot Ridge, Colorado; Mauna Loa, Hawaii; American Samoa; South Pole). See "Trends in Atmospheric Nitrous Oxide. NOAA/ESRL, January 2024. https://gml.noaa.gov/ccgg/trends_n2o/..
[24] Ibid.
[25] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pg. ES-14).
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[29] Ibid, Pg. 2-9.
[30] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pg. 2-35).
[31] U.S. territories consumption data that are obtained from EIA are only available at the aggregate level and cannot be broken out by end-use sector. The distribution of emissions to each end-use sector for the 50 states does not apply to Territories data.
[32] "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022." U.S. Environmental Protection Agency, Office of Atmospheric Programs, April 11, 2024. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022. (Pg. 2-41).
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U.S. Biennial Transparency Report

Chapter 3:

Information Necessary to Track Progress

for implementing and achieving nationally determined contributions under Article 4 of the Paris Agreement

Chapter 3: Information necessary to track progress made in implementing and achieving nationally determined contributions under Article 4 of the Paris Agreement

Introduction

The United States is the largest economy in the world and the third largest country in terms of population and geographic area. The country covers a vast, varied area that stretches across a continent, has a complex and dynamic economic structure, and is home to a richly diverse population. This gives rise to a unique set of domestic circumstances, and a singular role in global systems. National circumstances that affect greenhouse gas (GHG) emissions and removals include market dynamics, technological innovation, economic growth, energy production and consumption, population and density trends, use of land and natural resources, and climate and biogeographic conditions. This chapter includes the following elements:

A. National circumstances and institutional arrangements;
B. Description of the U.S. nationally determined contribution (NDC);
C. Information necessary to track progress made in implementing and achieving the U.S. NDC under Article 4 of the Paris Agreement;
D. Mitigation policies and measures, actions, and plans related to implementing and achieving the U.S. NDC under Article 4 of the Paris Agreement;
E. Summary of greenhouse gas emissions and removals; and
F. Projections of greenhouse gas emissions and removals.

A. National Circumstances and Institutional Arrangements

Government Structure

The United States is a Federal republic of 50 states, plus the District of Columbia and U.S. territories. The Constitution of the United States assigns certain powers to the Federal

Government, with other responsibilities entrusted to the states. Local governments, as well as Tribal governments, are charged with governance responsibilities at the corresponding level of subnational government. Tribal governments exercise governmental authority over a broad range of internal and territorial affairs. This shared responsibility for policy in areas such as economic growth, energy development, transportation, land use planning, and natural resource use creates the opportunity for action and coordination at multiple levels.

Federal Government

The U.S. Federal Government is divided into three branches: executive, legislative, and judicial. Each branch of government is assigned specific authorities and plays distinct roles in creating, implementing, and adjudicating laws and regulations. This same three-branch structure is also replicated at the state level, and often at lower levels of government as well. This structure creates a system of "checks and balances" which shapes the development and implementation of policy. Each of the three branches of government has a role in addressing energy, environment, and climate change-related issues within the Federal Government.

Executive Branch

The executive branch of the Federal Government is responsible for implementing and enforcing the laws of the United States. The scope of its responsibility covers a wide range of areas, including enacting regulations through the rulemaking process, supporting innovation and research and development, implementing foreign policy, maintaining Federal highway and air transit systems, and managing Federal lands.

The President of the United States is the head of the executive branch and is advised by the Vice President and a Cabinet of senior officials. This Cabinet is composed of the heads of 15 executive agencies – the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, Interior, Justice, Labor, State, Transportation, Treasury, and Veterans Affairs, as well as the White House Chief of Staff, the U.S. Ambassador to the United Nations, the Director of National Intelligence, the U.S. Trade Representative, and the heads of the U.S. Environmental Protection Agency (EPA), Office of Management and Budget, Council of Economic Advisers, Office of Science and Technology Policy, and Small Business Administration.

For the first time, the President was advised by a National Climate Advisor and a Special Presidential Envoy for Climate. In recognition of the seriousness of the climate crisis, these positions were newly created in 2021 to lead and coordinate the development and implementation of domestic and international climate change policy, respectively. The Executive Office of the President includes several offices with relevance to environmental and energy policy, including the new Office of Domestic Climate Policy and the Office on Clean Energy Innovation and Implementation, in addition to the National Security Council, the Domestic Policy Council, and the Council on Environmental Quality.

Within the executive branch, the purview for energy, environment, and climate-related issues falls under some two dozen Federal agencies and executive offices, as well as a number of independent commissions, boards, and agencies such as the Federal Energy Regulatory Commission. Relevant agencies and offices work together to advise, develop, and implement policies that help the U.S. government understand the workings of the Earth's climate system, increase innovation related to clean energy and energy efficiency, work towards low GHG energy systems, enhance the sustainability of land and natural resource management, and assess and respond to the adverse effects of climate change. The actions of these agencies are described in relevant chapters of this report.

Legislative Branch

The Federal legislative branch is comprised of the U.S. Congress which has two chambers: the Senate and the House of Representatives (House). The Senate includes 100 elected members, two from each state, with Senators serving six-year terms of office. The House is made up of 435 elected members, each representing a single congressional district of an average of approximately 760,000 people.[1] Representatives serve two-year terms of office. The bicameral nature of Congress is intended to balance representation based on population and representation based on statehood.

Both the Senate and the House have the authority to develop legislation. A completed bill must receive a majority of votes in each chamber. Congress is also responsible for raising revenue through taxation and authorizing the use of public funds by the executive branch through the budget and appropriations process. Any difference between House and Senate bills must be reconciled before the bill can be sent to the President for signature. Legislation becomes effective upon signature by the President. As new legislation must be approved by a majority in both chambers of Congress and signed by the President, the threshold of support required to enact new laws remains high.

Committees within each chamber of Congress are tasked with considering and developing draft legislation on specific topics. In the House, the Committees on Appropriations; Agriculture; Science, Space, and Technology; Ways and Means; Natural Resources; and Energy and Commerce, among others, consider topics relevant to climate, environment, energy, and land use. In the Senate, the Committees on Environment and Public Works; Finance; Foreign Relations; Agriculture; Commerce, Science, and Transportation; Energy and Natural Resources; and Indian Affairs develop legislation on these topics and are similarly critical venues for debate.

Judicial Branch

The judicial branch of the Federal Government is responsible for interpreting the U.S. Constitution, among other duties. The Supreme Court is the highest court in the United States. The judicial branch plays a significant role in defining the jurisdiction of the executive branch departments and interpreting laws, including those related to energy, environment, and climate policy.

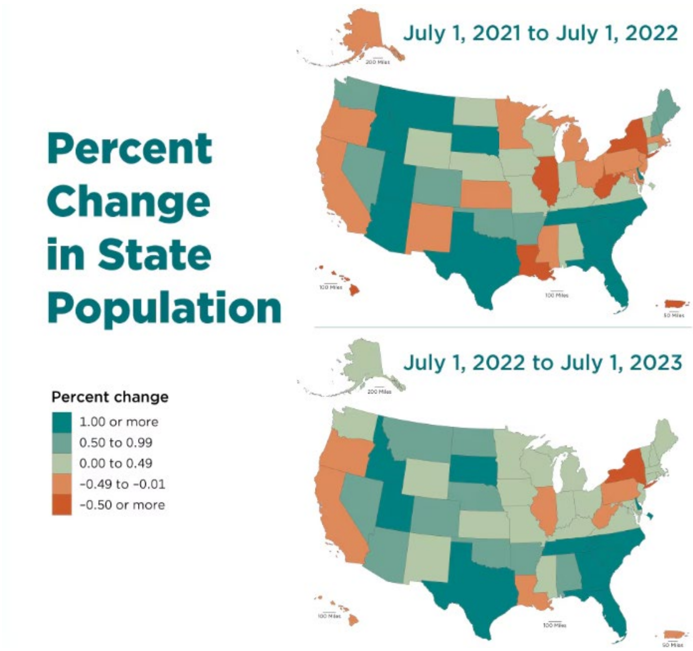
Subnational Actors

As a Federal system, jurisdiction for issues related to energy, environment, and climate change is shared by Federal, state, local, and tribal governments. For example, while the Federal Energy Regulatory Commission regulates wholesale sales and transportation of natural gas and electricity, some economic regulation of energy distribution is the responsibility of the states. Within the scope of their authorities, states may establish energy-sector standards, mandate building energy efficiency standards, set emissions targets, plan and build transportation and energy infrastructure, establish state or regional carbon markets, and determine land use practices on state lands, among other actions. Cities may also set emissions targets. Together with states, they determine how non-Federal transportation systems and other infrastructure are planned and implemented. Tribal governments have similar authorities for tribal lands. Many states, cities, and tribes in the United States are implementing policies relevant to climate change mitigation and adaptation. Examples of these activities are provided later in this chapter, in the “Mitigation policies and measures” section.

Population Profile

The estimated population of the United States as of 2023 was approximately 334.9 million,[2] making the United States the third most populous country in the world. This represents an increase of over 30 percent above 1990 levels. The U.S. population grew 0.5 percent from 2022 to 2023. While this rate of growth is low in a historical context, it reflects a return to pre-pandemic growth patterns. In 2023, 42 states and the District of Columbia saw population increases, with 87 percent of the growth concentrated in the U.S. South (see Figure 3-1). While the birth rate remains low, deaths declined by 9 percent and immigration has rebounded post-pandemic, leading to net growth.[3]

Figure 3-1: Percent Change in State Population



Source: U.S. Census Bureau[4]

By 2050, the total population of the United States is expected to reach approximately 360 million people.[5] According to the U.S. Census Bureau, the population is projected to increase to nearly 370 million in 2080 before beginning to decline.[6]

Geographic Profile

The United States is a large and diverse country. It extends across 9,192,000 square kilometers (km^2) (3,548,112 square miles [mi^2]) and six time zones, with a mainland bounded by the Atlantic Ocean to the east, the Pacific Ocean to the west, Canada to the north, and Mexico and the Gulf of Mexico to the south.

Given the size and extent of U.S. territory, its biogeophysical profile is extremely varied. Ecosystems range from the Arctic tundra of northern Alaska to the tropical forests of Hawaii and the overseas U.S. territories. Temperate rainforests in the Pacific Northwest give way to Mediterranean landscapes and then deserts of the Southwest. The soaring Rocky Mountains stretch north to south in the middle of the country, with Alpine ecosystems on peaks more than

4,390 meters (14,400 feet) tall. Moving east, grassland prairies transition into rich swathes of agricultural land interspersed with temperate deciduous and coniferous forests. The Great Lakes, the largest freshwater system in the world, and great rivers such as the Mississippi and Missouri, define the middle of the country. Along the coast of the Gulf of Mexico, riverine estuaries and wetlands gradually melt into the sea, while inland swamps such as the Everglades create unique habitats. The Appalachian Mountains mark a boundary between central and eastern lands, with temperate deciduous and coniferous forests pushing up against the beaches and marshes of the Eastern seaboard.

Approximately 60 percent of land in the United States is privately owned. Another 28 percent is owned and managed by the Federal Government. This area includes protected areas such as national parks, wilderness areas, wildlife refuges, and monuments; national forests; rangelands; and other public lands. Approximately 8 percent of land is owned and managed by state and local governments, and 3 percent is held in trust for Native Americans by the Bureau of Indian Affairs.[7] Through the America the Beautiful initiative, the United States pledged to conserve at least 30 percent of U.S. lands and waters by 2030.[8]

Economic Profile

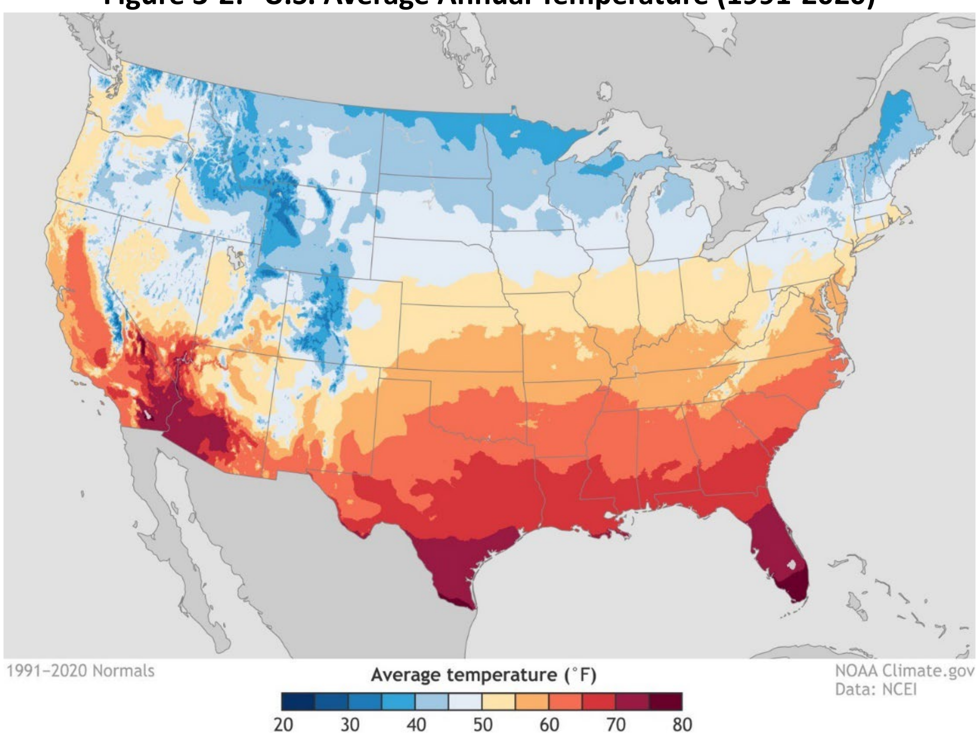
Following a decade of steady growth, the United States experienced its worst economic downturn since World War II in 2020 due to the global outbreak of COVID-19. After a sharp contraction during the Great Recession from late 2007 to mid-2009, the U.S. economy grew at an average annual rate of 2.3 percent from mid-2009 through 2019,[9] before shrinking precipitously by 3.4 percent in 2020 as the pandemic ravaged factories, businesses, and households. Unemployment spiked to over 14 percent – its highest on record since 1948 – in April 2020.[10] Since mid-2020, the economy has rebounded, with economic activity – and Gross Domestic Product (GDP) – continuing to expand. The GDP reached an estimated $28.26 trillion in the first quarter of 2024,[11] and the unemployment rate remained at a near-record low of 4.0 percent in May 2024.[12]

As described in Chapter 2, net GHG emissions experienced a corresponding rebound during the COVID-19 recovery period, from 22.7 percent below 2005 levels in 2020 to 16.7 percent below in 2022.[13] Preliminary data shows net GHG emissions resuming a downward trend beginning in 2023, in line with the U.S. NDC and net-zero target.

Climate Profile

The climate of the United States reflects its geographic diversity. Average annual temperatures decrease dramatically from south to north in the continental United States, as seasonal variability increases. The average annual temperature in Florida exceeds 21 degrees Celsius (70.7 degrees Fahrenheit), while that of Alaska is just -3 degrees Celsius (26.6 degrees Fahrenheit). Temperature ranges can be great, with some Great Plains states experiencing differences in temperature of as much as 50 degrees Celsius (122 degrees Fahrenheit) over the course of a year. Figure 3-2 illustrates the range in average temperatures over the past three decades across the contiguous United States. As very high or low outdoor temperatures require cooling or heating of buildings, annual average temperatures have a correlation to energy usage. A mild winter or a cool summer may correspond to lower energy usage, and thus to somewhat lower GHG emissions. This is reflected in annual estimates in the National Inventory Document (NID), discussed in Chapter 2.

Figure 3-2: U.S. Average Annual Temperature (1991-2020)

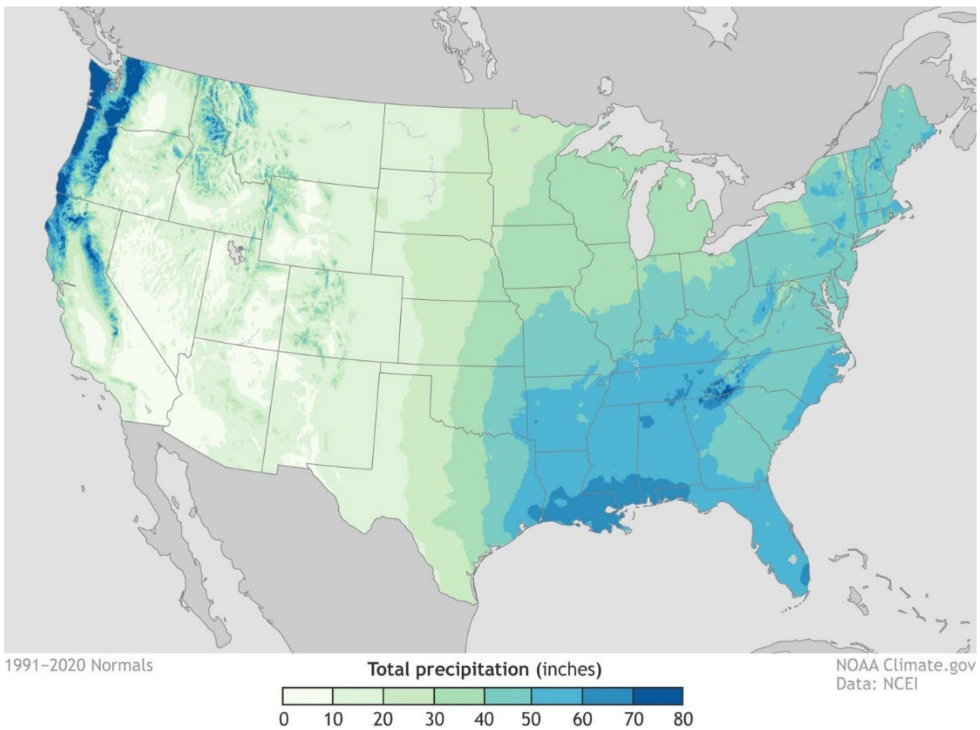


Source: U.S. National Oceanic and Atmospheric Administration (NOAA), National Centers for Environmental Information (NCEI)[14]

Similarly, precipitation varies across the United States in terms of quantity and seasonality. As Figure 3-3 depicts, while communities along the Gulf of Mexico may experience more than 127 centimeters (50 inches) of precipitation per year, parts of the Intermountain West and Southwest may receive less than 30 centimeters (12 inches). The peak rainfall season also varies by region, though the seasonality has varied in recent years. Parts of the Great Plains and

Midwest typically receive the greatest rainfall in the late spring, the West has a distinct wet season during the winter, the Deep South is affected by the North American monsoon, and many parts of the Gulf and Atlantic coastal regions see their greatest period of precipitation in the summer.

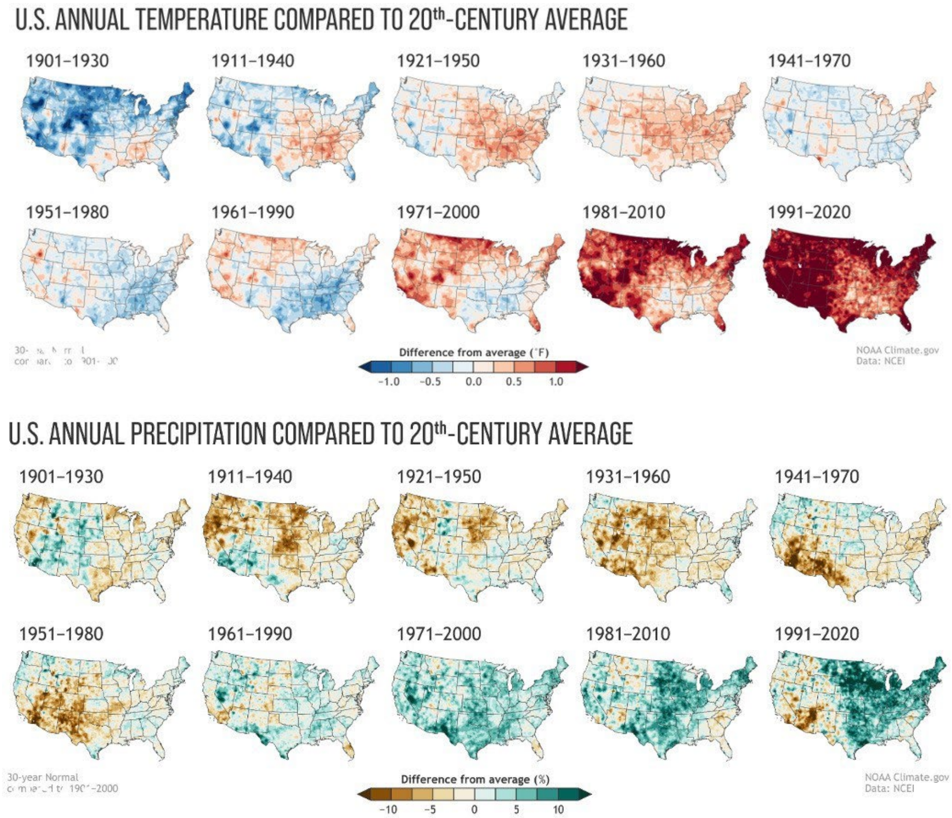
Figure 3-3: U.S. Annual Average Precipitation (1991-2020)



Source: NOAA, NCEI[15]

Communities across the United States are already experiencing the impacts of climate change, including significant shifts in temperature and precipitation, as shown in Figure 3-4. 2023 was the warmest year on record, both globally and in North America.[16] While trends in precipitation vary by region, overall levels have increased (see Figure 3-3), and at least some of this is linked to climate warming and the "wetting" of the atmosphere that has occurred as rising temperatures cause more water to evaporate from the ocean and land surface and increase the amount of water vapor that can be held in the atmosphere.[17]

Figure 3-4: Annual Temperature and Precipitation Compared to 20th Century Average

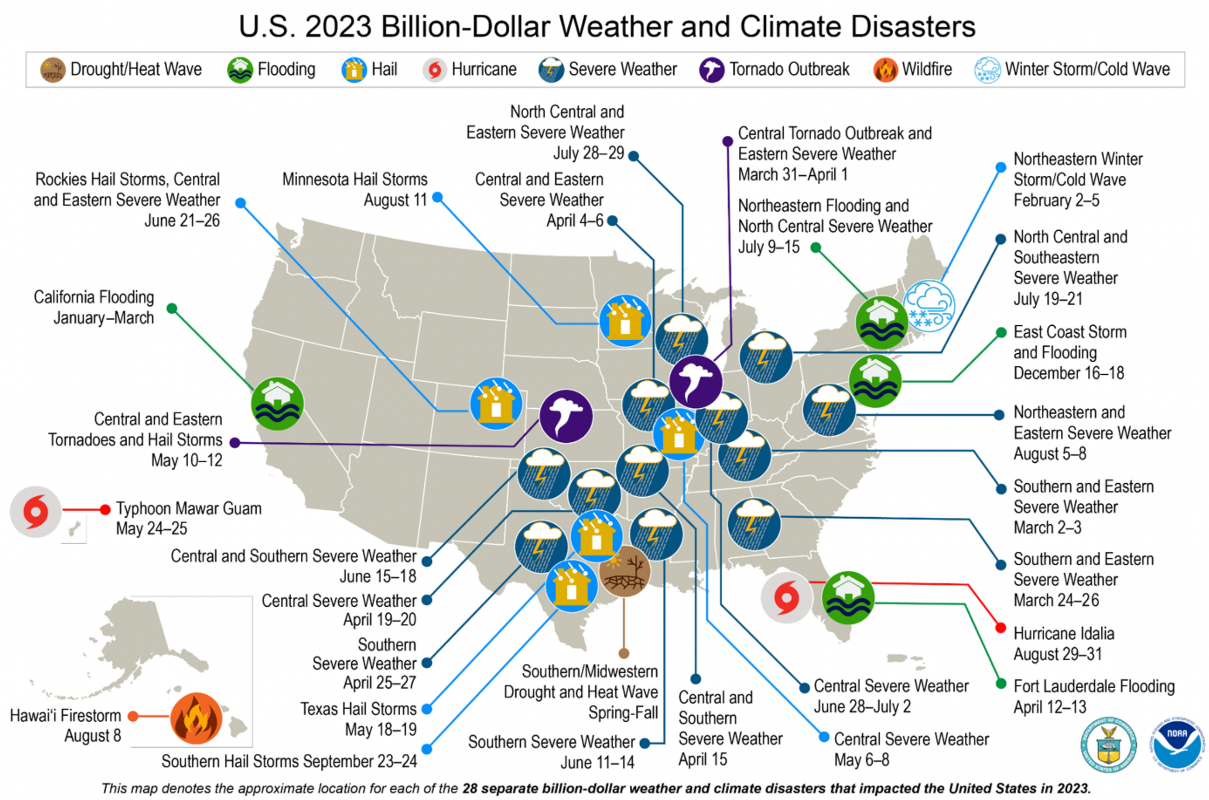


Source: NOAA[18]

In 2023, record-warm sea surface temperatures in the Atlantic helped generate 20 named tropical storm systems during 2023 – the fourth most named storms in a year since 1950. Seven of these storms were hurricanes; several caused significant damage and flooding. The U.S. Climate Extremes Index (USCEI) for 2023 was 65 percent above average and ranked 11th highest in the 114-year record. Elevated extremes in both warm maximum and minimum temperatures throughout the year were the main contributor to this above-average value. Several regions also saw elevated extremes in the number of days with precipitation, or in one-day precipitation extremes. The USCEI is an index that tracks extremes (falling in the upper or lower 10 percent of the record) in temperature, precipitation, drought, and landfalling tropical cyclones across the contiguous United States.[19]

More frequent and intense extreme weather and climate-related events are damaging infrastructure, ecosystems, and the social systems that provide essential services. In the 1980s, the United States experienced, on average, one (inflation-adjusted) billion-dollar weather disaster every four months. Now, there is one every three weeks, on average. Between 2018 and 2022, the United States experienced 89 billion-dollar events.[20] In 2023, there were 28 weather and climate disasters costing at least 1 billion dollars – a record number. As shown in Figure 3-5, these disasters included a winter storm and cold wave in the northeast; a wildfire on the island of Maui, Hawaii; a drought and heat wave across the central and southern states; four flooding events; two tornado outbreaks; two tropical cyclones; and 17 severe weather and hail events. These events caused at least 492 fatalities.[21]

Figure 3-5: U.S. 2023 Billion-Dollar Weather and Climate Disasters



Source: NOAA, NCEI[22]

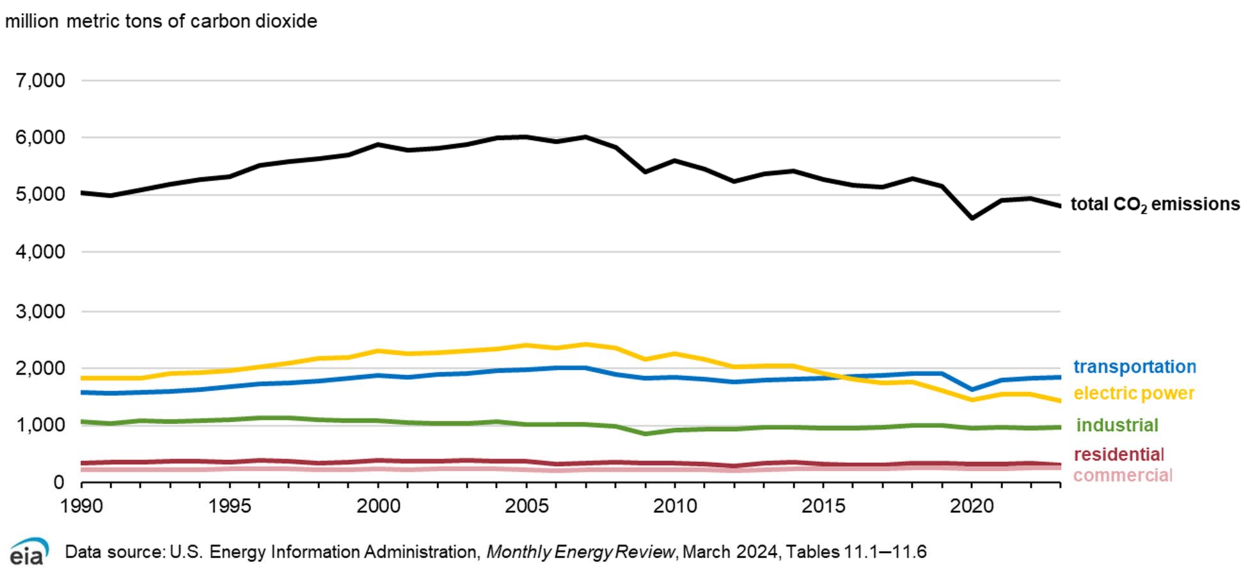
Sector Details

Energy

The United States is the world's second-largest producer and consumer of energy. Energy production and use currently represents the second-largest source of GHG emissions in the United States, after transportation. There are significant opportunities to mitigate GHG emissions through energy efficiency, electrification of end-uses that currently burn fossil fuels, and increasing the supply and use of clean, carbon-free energy sources. The United States continues to be a leader in clean energy innovation and deployment, with substantial investment into research, development, demonstration, and deployment of clean energy. The Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) have instituted a series of tax credits, investments in energy infrastructure, and support for research that is paying dividends in terms of enhancing access to stable clean energy supplies and bringing down costs for renewable energy, increasing the supply of clean energy of a range of sources.

These reductions were caused largely by a reduced share of coal-fired power generation and increased use of solar and natural gas.[23] This change in generation mix away from coal, which has the highest carbon intensity among fossil fuels, resulted in a 7 percent decrease in power sector Carbon dioxide (CO_2) in 2023 (Figure 3-6). A mild winter also led to decreased demand for heating, both for the residential sector (8 percent lower in 2023 than 2022) and the commercial sector (4 percent lower in 2023 than 2022).[24]

Figure 3-6: U.S. Energy-related CO_2 Emissions by Sector, 1990-2023



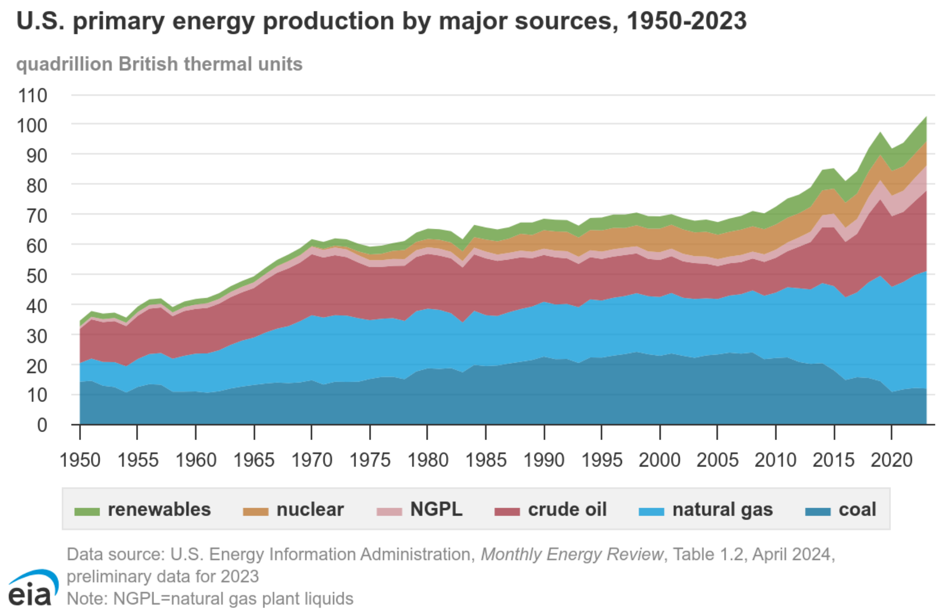
Source: U.S. Energy Information Agency (EIA)[25]

Energy Production and Consumption

In 2019, U.S. domestic energy production exceeded consumption on an annual basis for the first time since 1957. This trend has continued through 2023.[26] After a dip in production in 2020, largely due to the COVID-19 pandemic, total energy production and consumption both increased sharply as the economy began to recover. The relative share of each energy source in both production and consumption has shifted over time.

In 2023, natural gas represented 38 percent of energy produced. Petroleum (crude oil and natural gas plant liquids) made up 34 percent; coal comprised 11 percent, and renewables made up 8 percent (Figure 3-7).[27]

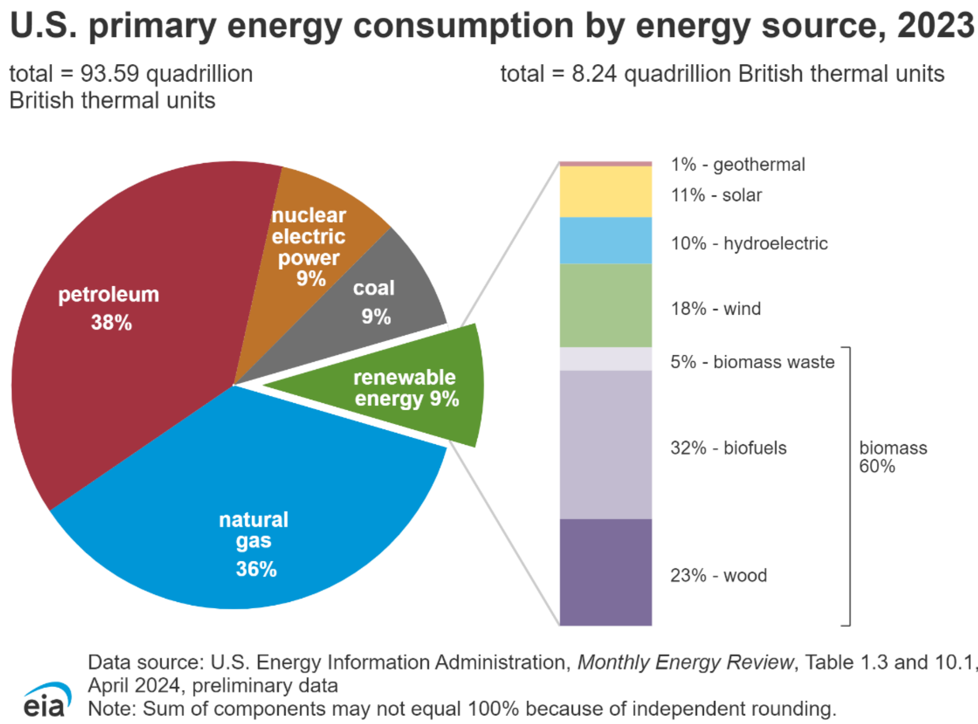
Figure 3-7: U.S. Primary Energy Production by Major Sources, 1950-2023



Source: U.S. EIA[28]

The energy sources consumed in the United States reflected a similar pattern, with petroleum (38 percent) and natural gas (36 percent) accounting for the majority of energy use, followed by renewable energy (9 percent), coal (9 percent), and nuclear energy (9 percent) in 2023 (Figure 3-8).[29] In recent years the share of renewable energy sources, which includes solar, wind, biomass, hydropower, and geothermal, has increased, while the share of coal continues to decline. This represents the continuation of a trend seen over the previous two decades, with coal consumption declining precipitously, and natural gas and renewable energy consumption increasing (Figure 3-9).

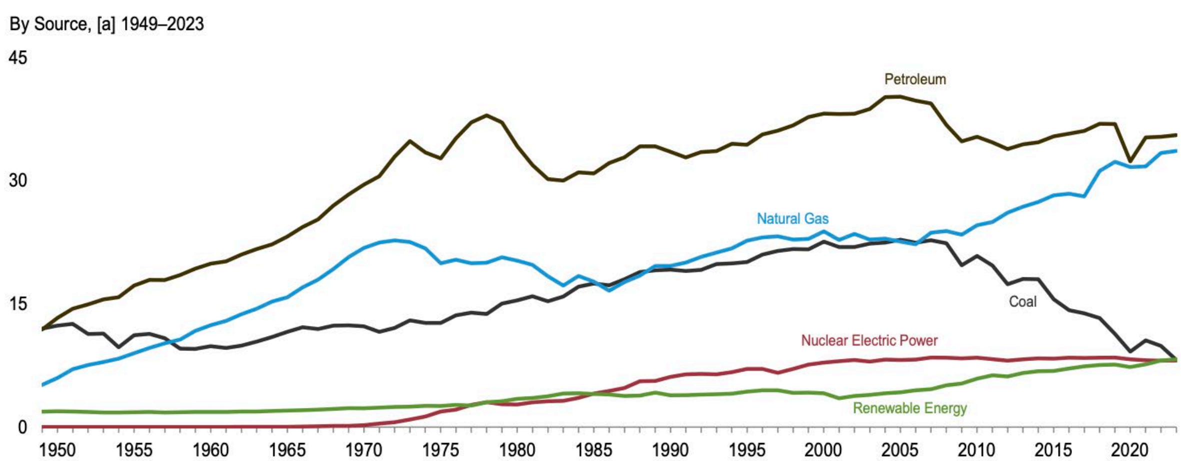
Figure 3-8: U.S. Primary Energy Consumption by Energy Source, 2023



Source: U.S. EIA[30]

Figure 3-9: U.S. Primary Energy Consumption by Energy Source

(Quadrillion British Thermal Units [Btu])



Source: U.S. EIA[31]

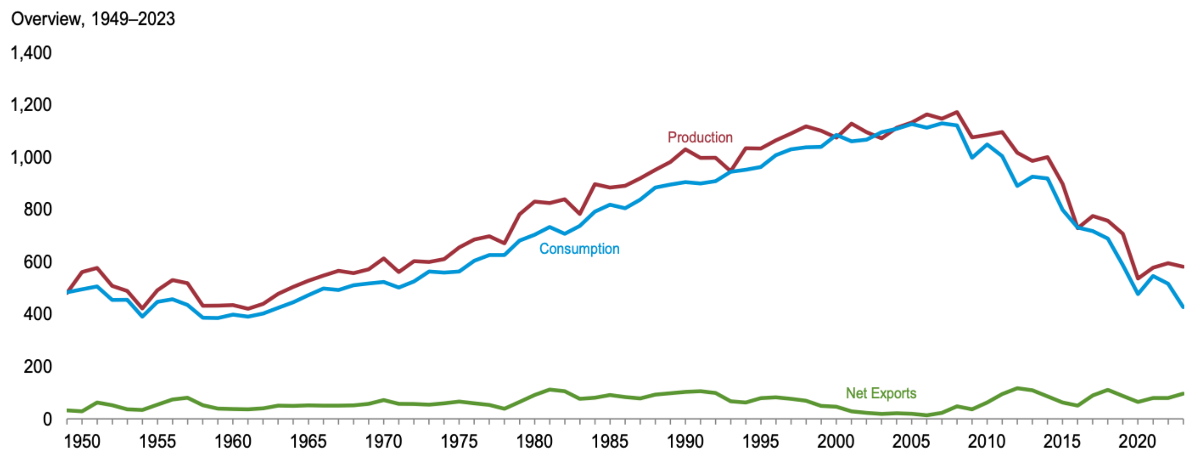
Fossil Fuels

Fossil fuels – petroleum, natural gas, and coal – accounted for the majority of total U.S. primary energy production and consumption in 2022 and 2023. While these sources have dominated the U.S. energy mix for more than a century, the fossil fuel mix has shifted significantly over time toward less carbon-intensive sources.

COAL

Electric power generation has been the largest consumer of coal since the 1960s, while industrial sector use of coal has slowly declined since the 1970s. Coal consumption in the United States peaked in 2007 at about 1.13 billion short tons, and coal production peaked in 2008 at about 1.17 billion short tons. Due to weakening demand from the electricity sector, both production and consumption have declined nearly every year since (Figure 3-10). Production in 2023 was 580.4 million short tons, close to half the peak level, while consumption was 426.5 million short tons.[32]

Figure 3-10: Annual U.S. Coal Production (million short tons)

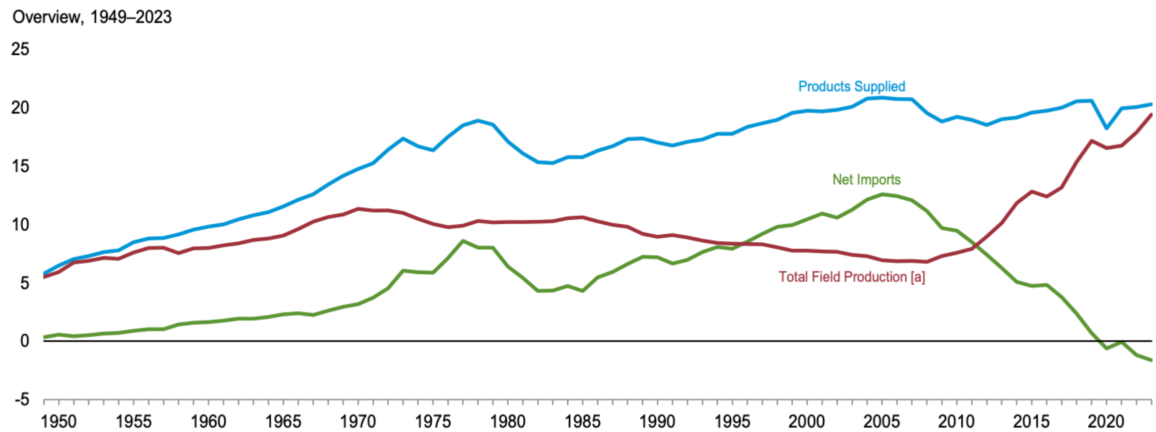


Source: U.S. EIA[33]

PETROLEUM

Following a general decline between 1970 and 2008, annual U.S. crude oil production began to rise in 2009. It reached a high of 12.2 million barrels per day in 2019, largely driven by increasingly cost-effective drilling and production technologies. After a decline in daily production in 2020 due to a large drop in demand resulting from the COVID-19 pandemic, the previous trend resumed (Figure 3-11). In 2023 production reached an average of 12.9 million barrels per day.[34]

Figure 3-11: Petroleum Overview (million barrels per day)



Source: U.S. EIA[35]

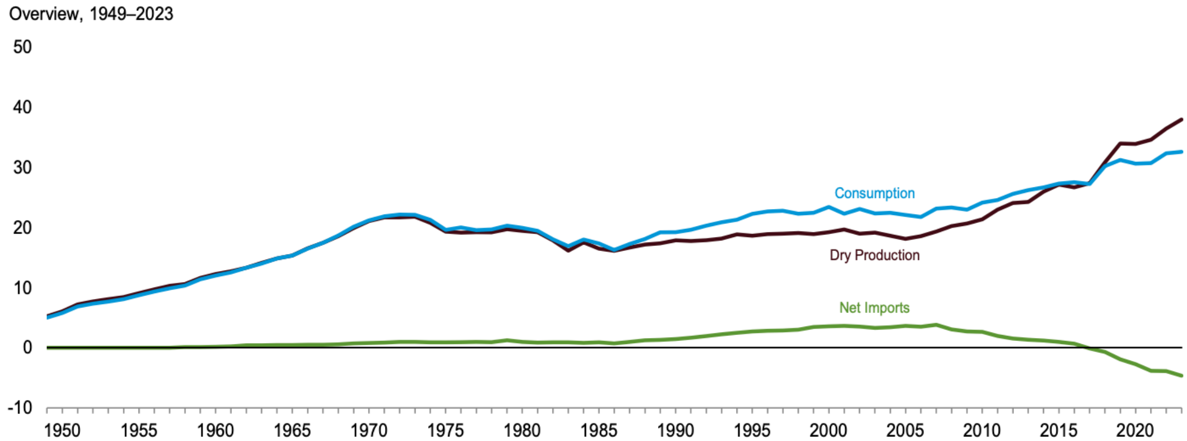
The transportation sector is the largest source of demand for petroleum, with consumption rising steadily over the last decades as miles traveled increased (and again, with a temporary decline in 2020). Demand for industrial uses has increased slightly in recent decades, while residential and commercial demand has declined since the late 1970s. Electric power generation accounts for less than 0.5 percent of petroleum demand.[36]

NATURAL GAS

Natural gas production in the United States has increased over the past decade, as widespread adoption of horizontal drilling and hydraulic fracturing techniques has allowed operators to produce natural gas from shale formations more economically. These production increases have contributed to a decline in natural gas prices, which in turn has contributed to increases in natural gas use by the electric power and industrial sectors. In 2023, both natural gas consumption and production reached record highs (Figure 3-12).[37]

Natural gas has been the largest source of electricity generation in the United States since surpassing coal in 2016.[38] This has occurred while 37 gigawatts of capacity, or 17 percent of the U.S. coal-fired fleet, have retired since 2021.[39] The displacement of more carbon-intensive fossil fuels has had reduced overall greenhouse gas emissions from the energy sector.

Figure 3-12: U.S. Natural Gas Consumption and Production



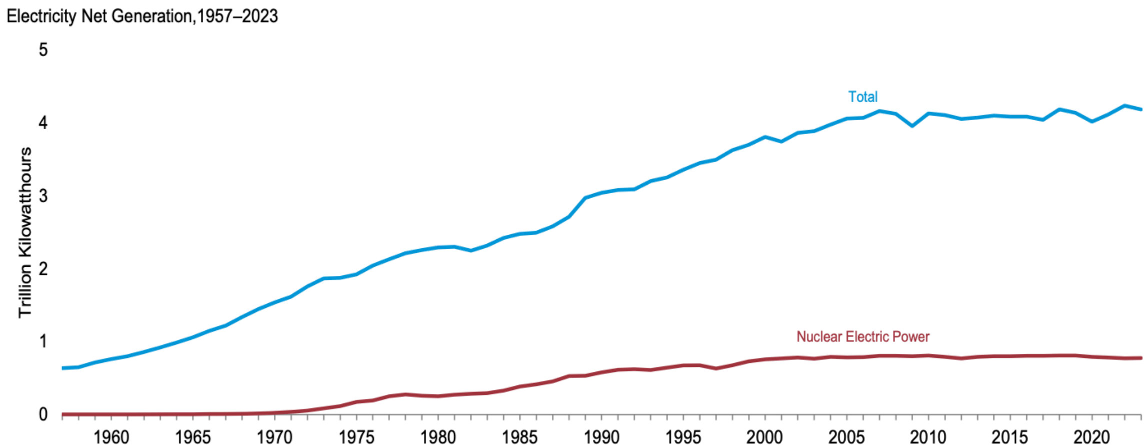
Source: U.S. EIA Monthly Energy Review[40]

Nuclear

Nuclear energy production in commercial nuclear power plants in the United States began in 1957, grew sharply through 1990, and slightly from 1990-2000, and generally leveled off after 2000.[41] The amount of nuclear energy production in 2023 was about 775.3 billion kilowatt hours (kWh), from 93 units.[42] While the number of operating reactors has declined since 2012, increases in capacity at existing plants have allowed a relatively consistent level of annual U.S. nuclear electricity generation for the past 20 years.[43]

Nuclear power plants have consistently provided about 20 percent of total U.S. electricity generation since the 1990s (Figure 3-13).[44] Of the 28 U.S. states with operating commercial nuclear power plants, 12 states generated more than 30 percent of their electricity from nuclear power, and three states (New Hampshire, South Carolina, and Illinois) generated more than 50 percent of their in-state electricity from nuclear power.[45]

Figure 3-13: Electricity Net Generation (trillion kWh)

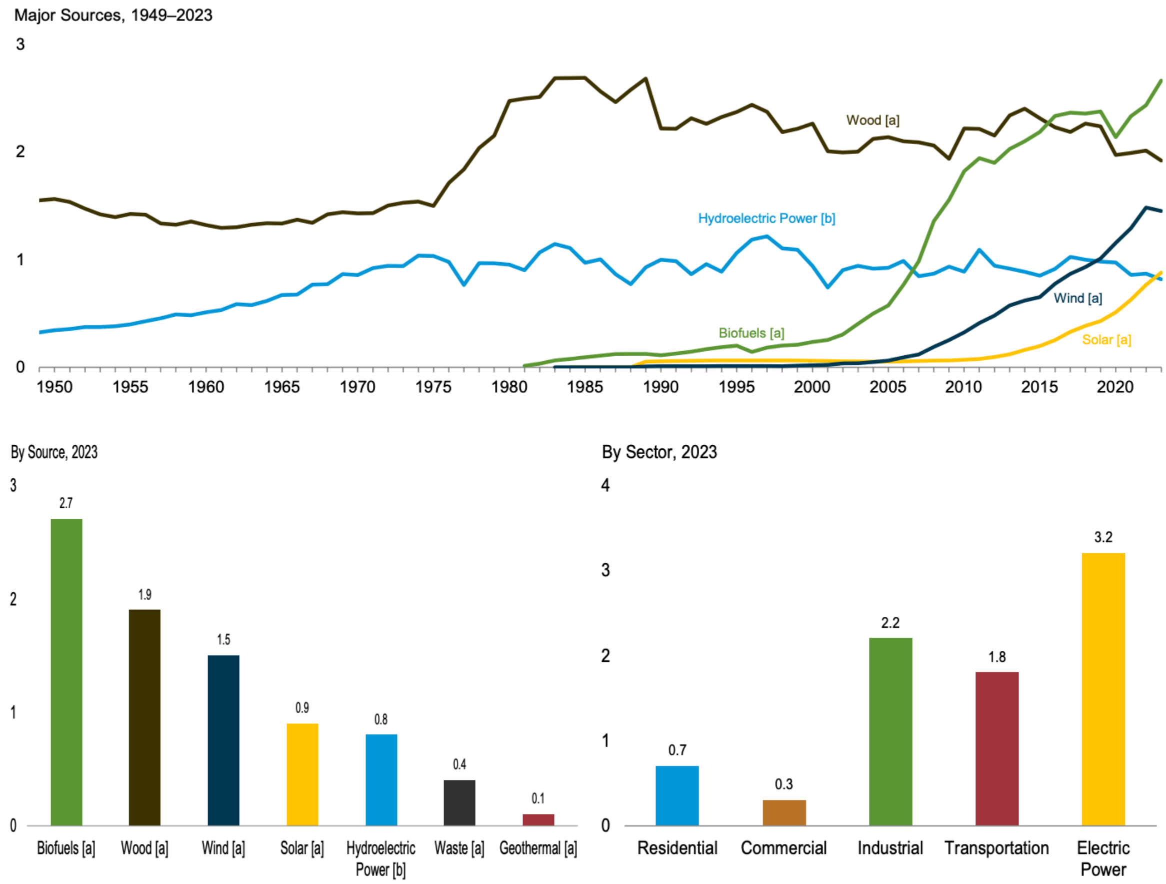


Source: U.S. EIA[46]

Renewables

In 2023, renewable energy production and consumption (including wind, hydroelectric, solar, biomass, and geothermal energy) both reached record highs of about 8,426 and 8,245 trillion Btu, respectively.[47] This was driven by record-high production of solar energy and bioenergy (biofuels, wood), and near-record production of wind energy (Figure 3-14). Geothermal production has remained steady for the last two decades, while hydroelectric power production in 2023 was lower than the 10-year average, primarily due to ongoing drought in parts of the western United States.[48, 49]

Figure 3-14: Renewable energy consumption (Quadrillion Btu)

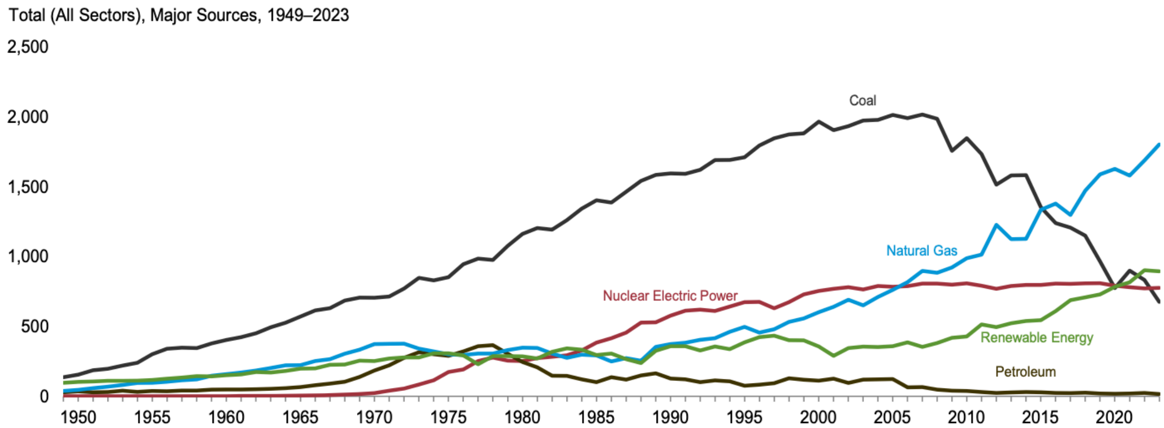


Source: U.S. EIA[50]

In 2022, electric generation from renewable energy surpassed coal and nuclear in the U.S electric power sector (Figure 3-15).[51] This increase was largely driven by increases in wind and solar capacity. By 2023, renewables represented approximately 22 percent of electric power produced.[52] Solar and wind alone are on track to surpass coal electricity generation in 2024.[53]

Figure 3-15: U.S. Electricity Net Generation

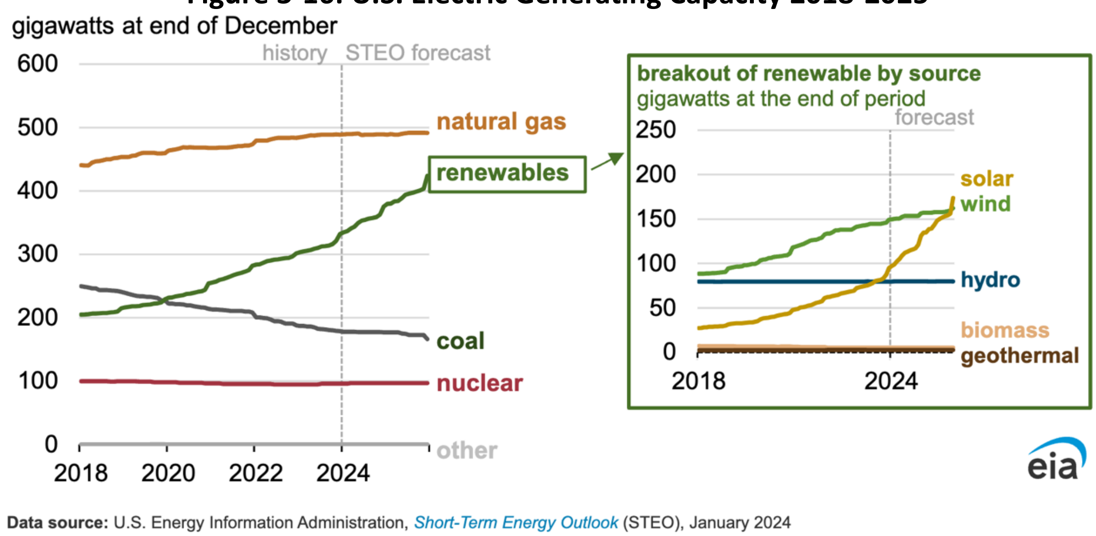
(Billion kWh)



Source: U.S. EIA Monthly Energy Review[54]

Electricity generation from wind, currently the most prevalent source of renewable electricity in the United States, grew by 253 percent from 2013 to 2023 (167.8 billion kWh to 425.2 billion kWh). Electricity generation from utility-scale solar facilities grew 1,728 percent over the same period, from 9.0 billion kWh to 164.5 billion kWh.[55]

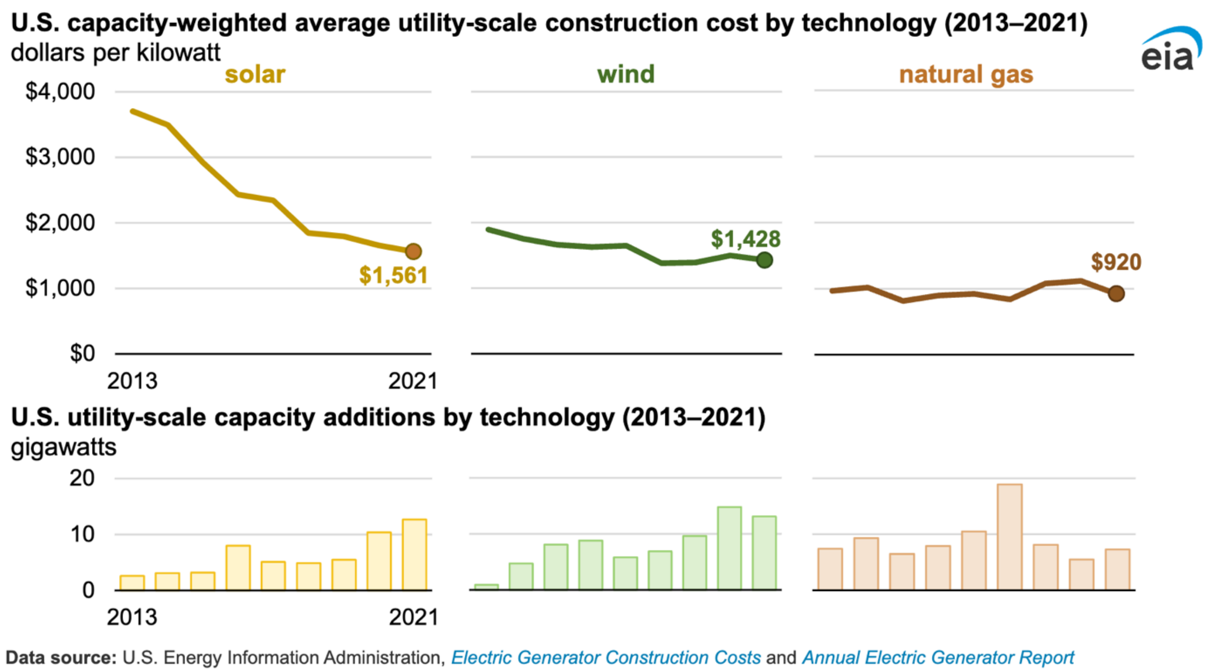
Figure 3-16: U.S. Electric Generating Capacity 2018-2025



Source: EIA[56]

Solar and wind energy are expected to comprise the majority of growth in U.S. power generation over the next two years, with solar power generation growing 75 percent from 2023 to 2025, and wind power generation increasing by 11 percent over the same period (Figure 3-16).[57] The increase in renewable generation in recent years has been spurred in part by tax credits and other incentives, but also reflects a fall in costs. Average U.S. construction costs for renewable generation have fallen significantly in recent years and continue to drop year on year. Average construction costs fell by 18 percent for natural gas-fired generators from 2020 to 2021, by 5 percent for wind turbines, and by 6 percent for solar photovoltaic systems over this year (Figure 3-17).[58]

Figure 3-17: U.S. Construction Costs for Solar, Wind, and Natural Gas-Fired Generators



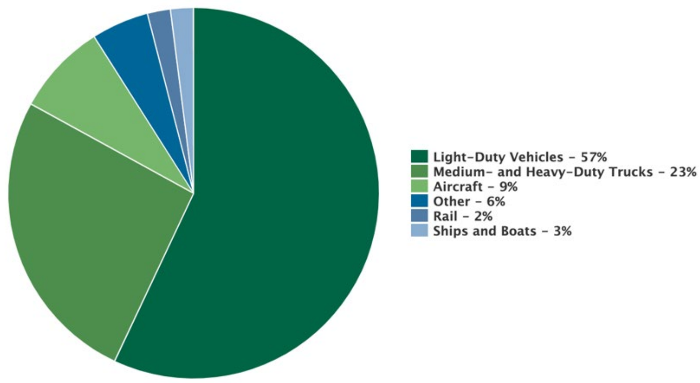
Source: U.S. Energy Information Agency[59]

Transportation

In 2017, the U.S. transportation sector overtook the power sector as the leading source of GHG emissions for the first time since the late 1970s.[60] In 2022, the transportation sector represented 28 percent of gross U.S. GHG emissions.[61] Transportation emissions have grown significantly since 1990, in large part due to increased demand for travel compounded by a shift towards larger vehicles.[62] Emissions in the transportation sector are driven by passenger vehicles; vehicle miles traveled (VMT) by passenger cars and light-duty trucks increased by 47 percent from 1990 to 2022. Growth in air travel was also significant in recent years, with a 27 percent increase in passengers on U.S. airline-operated flights (domestic and international) between 2013 and 2023.[63] Freight transportation has also increased, with 22 percent more truck miles driven between 2012 and 2021.[64]

In 2022, the majority of U.S. transportation sector GHG emissions (57 percent) came from light-duty vehicles, with the remainder from medium- and heavy-duty trucks (23 percent), aircraft (9 percent), rail (2 percent), ships and boats (3 percent), and other sources such as buses and motorcycles (5 percent) as shown in Figure 3-18.

Figure 3-18: 2022 U.S. Transportation Sector GHG Emissions by Source

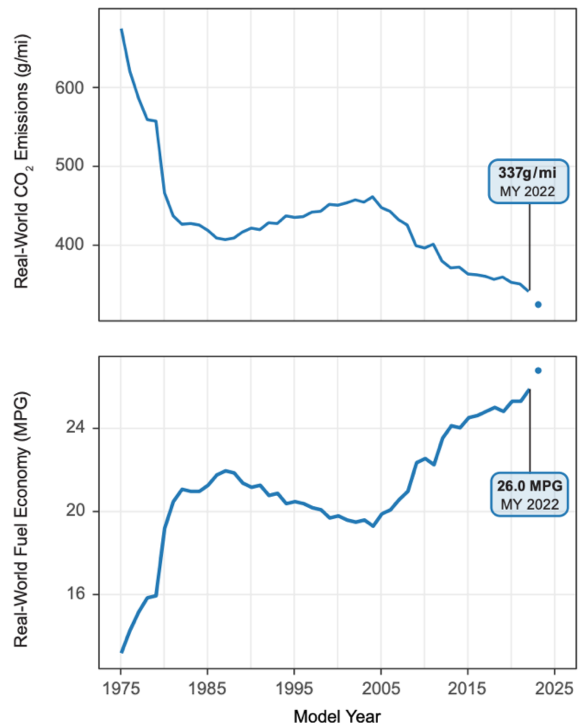


Source: U.S. EPA[65]

While emissions from the transportation sector have grown by nearly 19 percent since 1990, this growth is not evenly distributed. For example, emissions from passenger cars have fallen by 43 percent over this period, reflecting significant improvements in fuel economy and a transition towards more hybrid and electric vehicles (EVs). Over the same time, emissions from light-duty trucks, and medium- and heavy-duty trucks, increased by 118 and 76 percent, respectively.[66] As there are more light-duty trucks on the road than there are passenger cars, and sales continue to favor light trucks over cars, the shift towards larger, heavier vehicles contributes to the growth in emissions from the transportation sector.[67]

Transportation emissions trends reflect both more miles traveled and greater fuel economy. In model year 2022, the average estimated real-world CO_2 emission rate for all new vehicles fell by 10 grams/mile (g/mi) from the previous year to 337 g/mi. This is the lowest ever measured in the United States. Fuel economy increased by 0.6 miles per gallon (mpg) to 26.0mpg, achieving a record high. Since model year 2004, average CO_2 emissions per mile have decreased 27 percent (123 g/mi), and average fuel economy has increased 35 percent (6.7 mpg) (Figure 3-19). Preliminary data suggest that CO_2 emissions and fuel economy in model year 2023 will continue to improve.[68]

Figure 3-19: Estimated Real-World Fuel Economy and CO_2 Emissions[1]

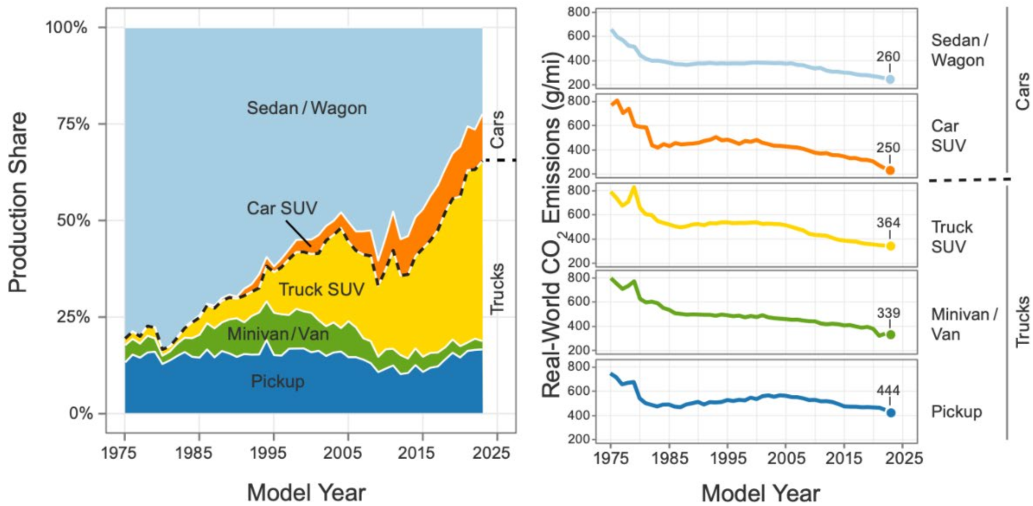


Source: U.S. EPA[69]

Since model year 2004, the average new vehicle fuel economy has increased by 35 percent, horsepower by 23 percent, and vehicle weight by 5 percent. The changes within each of these metrics are driven by a combination of design and technology changes within each vehicle type, and the market shifts between vehicle types (i.e., away from sedans/wagons and towards light trucks and crossovers). The transition towards vehicle types with lower fuel economy offsets some of the benefit made through improvements in fuel economy within each vehicle type.

[1] Dots represent preliminary data suggest for CO_2 emissions and fuel economy in model year 2023.

Figure 3-20: Production Share and CO_2 Emissions by Vehicle Type

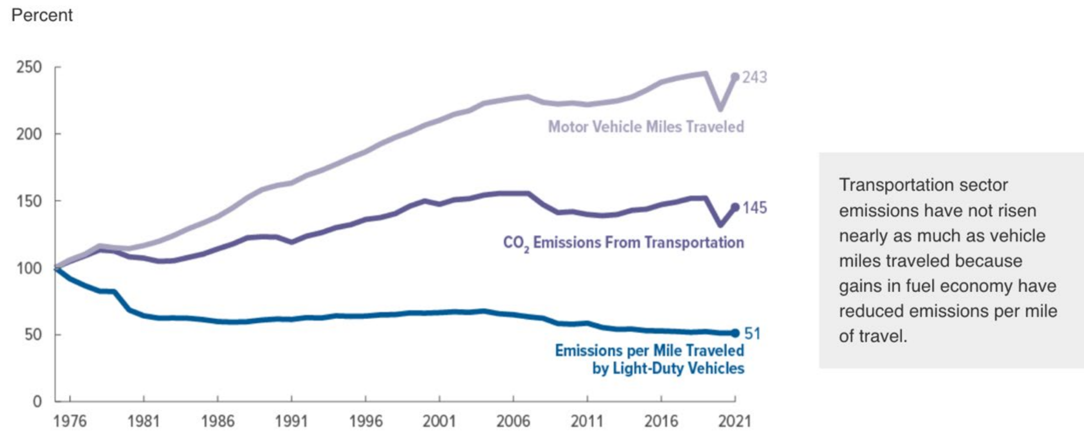


Source: U.S. EPA[70]

In model year 2022, four of the five vehicle types had their lowest CO_2 emissions and highest fuel economy ever. Car Sports Utility Vehicles (SUVs) decreased CO_2 emissions by 27 g/mi, pickups decreased by 18 g/mi, sedan/wagons decreased by 11 g/mi, and truck SUVs decreased by 4 g/mi. Minivan/vans, which accounted for less than 3 percent of new vehicle production in model year 2022, were the only vehicle type that had higher CO_2 emissions in 2022 compared to 2021, increasing by 17 g/mi (Figure 3-20).[71]

Improvements in fuel economy, an increasing share of hybrids and EVs, and the use of biofuels have contributed to a decline in the emissions per mile travelled of light-duty vehicles. This has limited the growth in emissions from ground transportation despite an upward trend in motor vehicle miles travelled, and a shift to heavier vehicles (Figure 3-21).

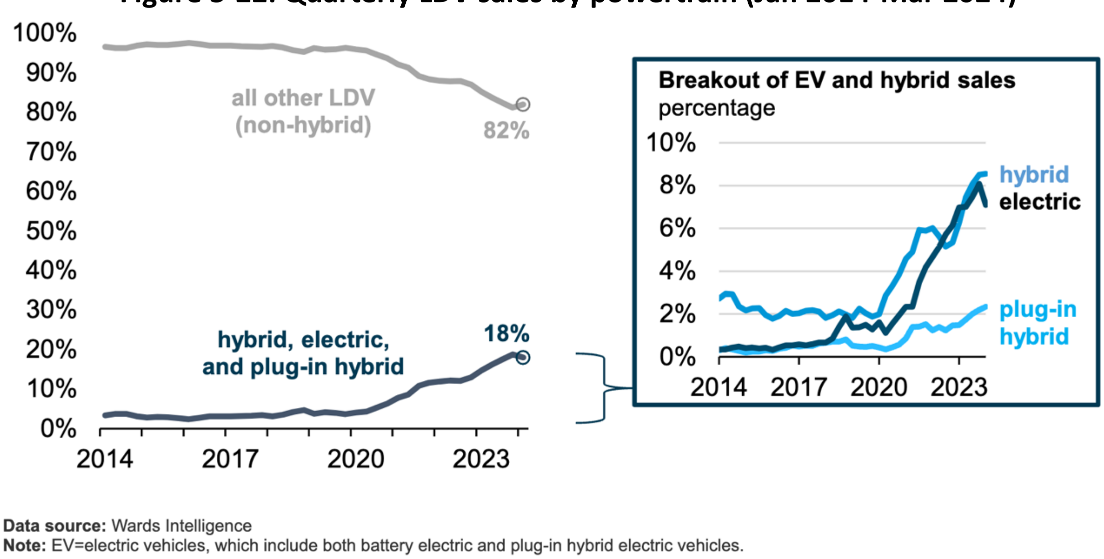
Figure 3-21: CO_2 Emissions in the Transportation Sector, Motor Vehicle Miles Travelled, and Emissions Per Mile Traveled of Light-Duty Vehicles, as a Percentage of 1975 Values



Source: U.S. Congressional Budget Office[72]

One of the most striking trends in recent years is the increase in sales of EVs and hybrid vehicles (Figure 3-22). In model year 2022, the combined category of EVs, plug-in hybrid vehicles (PHEVs), and fuel cell EVs (FCVs) increased from 4 percent of production in model year 2021 to 7 percent of production in model year 2022.[73] In the first quarter of 2024, EVs and hybrids represented 18 percent of light-duty vehicle (LDV) sales.[74] This trend will likely continue in coming years, due to falling prices for hybrids and EVs, improving infrastructure, and incentives provided under the IRA.

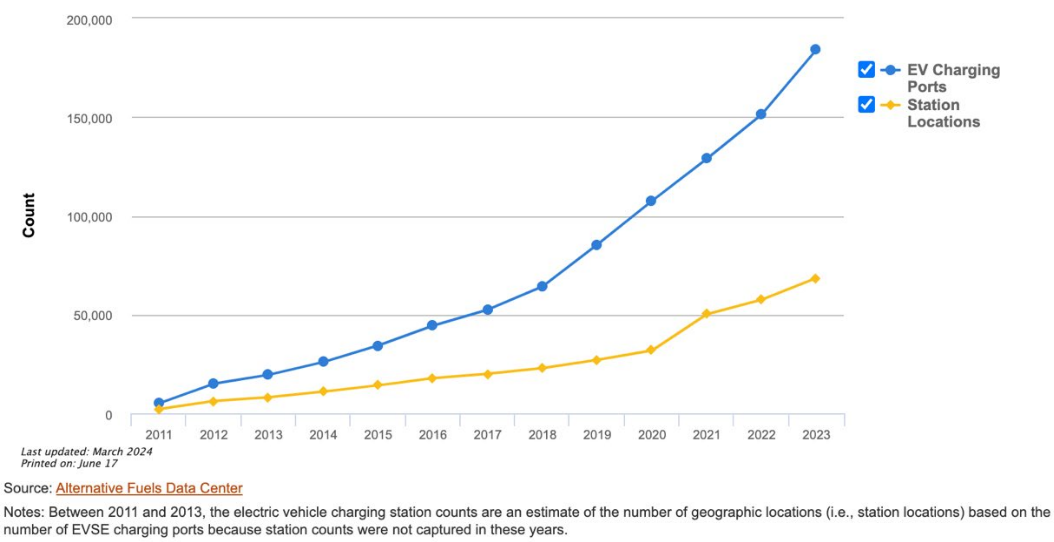
Figure 3-22: Quarterly LDV sales by powertrain (Jan 2014-Mar 2024)



Source: U.S. EIA[75]

This growth in EVs and hybrid vehicles has been supported by investments in charging infrastructure by the Federal Government, subnational governments, and private companies (Figure 3-23). The United States now has a network of charging stations across the country, though density varies by location. The BIL invests $7.5 billion in EV charging, with a goal of having high-speed chargers spaced no less than every 50 miles along major highways.[76] Many states also provide incentives for commercial and residential charging infrastructure.

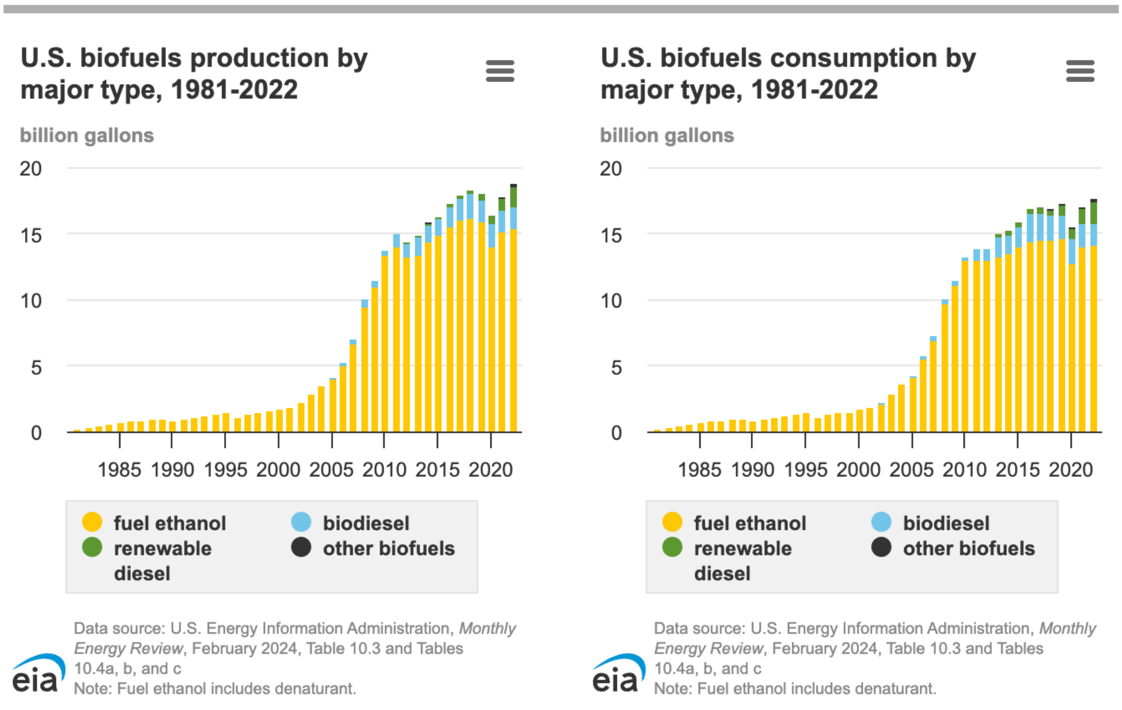
Figure 3-23: U.S. Public and Private EV Charging Infrastructure



Source: Alternative Fuels Data Center[77]

In addition to fossil fuels and electric power, bio-based fuels form an important source of energy for certain segments of the U.S. transportation fleet. Biofuels include fuel ethanol, biodiesel, and more recently, sustainable aviation fuels. Biofuels can have lower lifecycle greenhouse gas emissions than fossil fuels, though the emissions level depends on the specific feedstock and production pathway. The GHG intensity of domestic biofuels has improved over the past two decades.[78] Major U.S. feedstocks include corn, soybean, and other vegetable oils, animal fats, and waste oils. Due in part to the availability of Federal and state financial and other incentives, and the Federal Renewable Fuels Standard (RFS) Program, biofuel production and consumption has increased rapidly over the past two decades (Figure 3-24).

Figure 3-24: U.S. Biofuel Production and Consumption, 1981-2022



Source: U.S. EIA[79]

Industry

Direct industrial sector GHG emissions accounted for 23 percent of total U.S. GHG emissions in 2022,[80] making it the third largest contributor after the transportation sector and power sector. Industrial GHG emissions, resulting both directly from the combustion of fossil fuels and indirectly from the generation of electricity that is used by industry, accounted for about 30 percent of gross GHG emissions in 2022.[81]

From 2019-2020, total energy use in the industrial sector fell by 5 percent, in part due to reductions in economic and manufacturing activity resulting from the COVID-19 pandemic, but subsequently increased by 1.8 percent from 2021 to 2022 due to an increase in total industrial production and manufacturing output.[82]

Since 1990, total U.S. GHG emissions from industry, including electricity, have declined by 22 percent[83] as a result of energy efficiency improvements and other structural factors, including shifts in industrial output away from energy-intensive manufacturing products to less energy-intensive products (e.g., from steel to computer equipment).[84] The relative contribution of industrial sector emissions has also shifted over time, with emissions from the metal and chemical industries decreasing, and emissions from the chemicals that substituted for ozone-depleting substances (ODS) increasing. In 2022, the United States ratified the Kigali

Amendment to the Montreal Protocol and, under domestic authority in the American Innovation and Manufacturing (AIM) Act of 2020, is implementing actions to phase down the production and consumption of hydrofluorocarbons (HFCs) over time.[85]

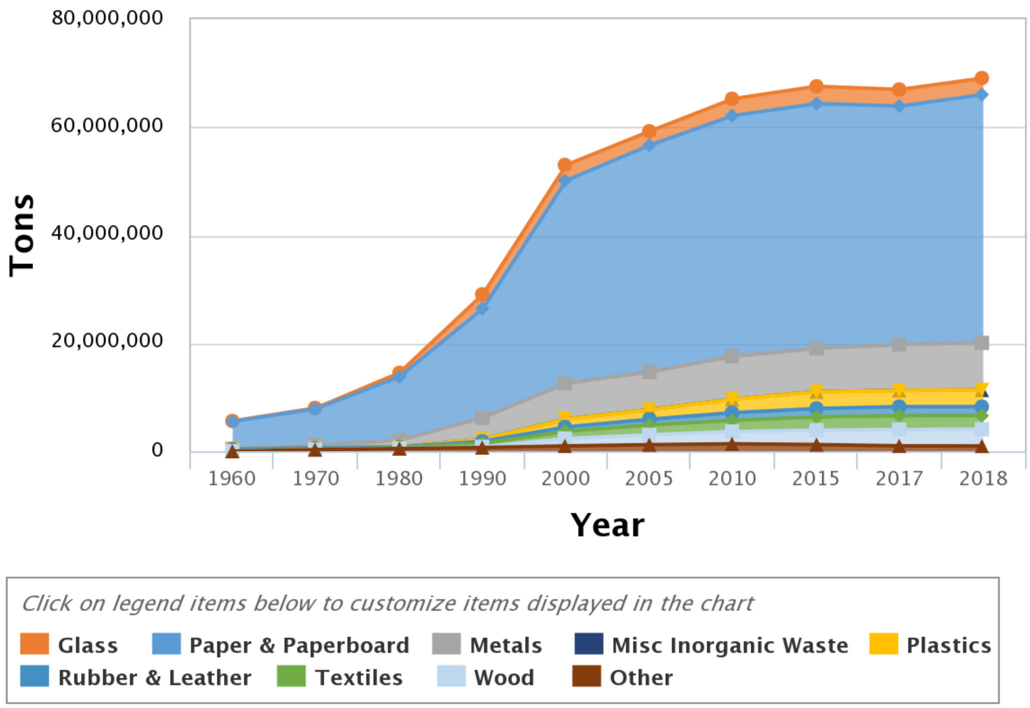
Waste Management

Waste management and treatment activities are sources of GHG emissions. Landfills accounted for approximately 17.1 percent of total U.S. anthropogenic methane (CH_4) emissions in 2022, the third largest source of CH_4 in the United States. Additionally, wastewater treatment and discharge, composting of organic waste, and anaerobic digestion at biogas facilities accounted for approximately 3.0 percent, 0.4 percent, and less than 0.1 percent of U.S. CH_4 emissions, respectively. Nitrous oxide (N_2O) emissions result from the discharge of wastewater treatment effluents into aquatic environments, the wastewater treatment process itself, and composting. Together, these waste activities account for 6.1 percent of total U.S. N_2O emissions.[86]

In 2018, the last year for which data was available, the United States generated approximately 292 million short tons of municipal solid waste (MSW) – an increase from 208 million short tons in 1990. Paper and paperboard products made up the largest component of MSW (about 23 percent), and food waste comprised the second-largest material component (22 percent). Yard trimmings and plastics constituted about 12 percent each, and the remaining amount of MSW generated was comprised of rubber, leather, textiles, metals, wood, glass and other materials.[87]

Recycling and composting have been the most significant changes in waste management from a GHG emissions perspective. In 2018, Americans recycled 69 million short tons of waste and composted 25 million short tons. In 2018, the recycling and composting rate (32 percent) was approximately double what it was in 1990 (Figure 3-25). Nearly 18 million short tons of food waste were managed through other processes (e.g., for animal feed, anaerobic digestion or co-digestion, or land application), and nearly 35 million short tons of municipal solid waste were combusted with energy recovery. The recycling, composting, combustion with energy recovery, and landfilling of MSW saved over 193 million tonnes of carbon dioxide equivalent (MMT CO_2 Eq.) in 2018 – comparable to the emissions that could be reduced from taking almost 42 million cars off the road for a year.[88]

Figure 3-25: Recycling Tons, 1960-2018



Source: U.S. EPA [89]

Building Stock and Urban Structure

Energy use for residential and commercial buildings accounted for about 28 percent (approximately 21 quadrillion BTU) of total U.S. end-use energy consumption in 2023.[90] Building energy consumption and GHG emissions are influenced by building type (commercial, residential, multi-unit, single-unit, and construction type), size, climate zone, building shell, and the appliances and heating, ventilation, and cooling systems (HVAC) installed.

Greenhouse gas emissions from these sectors are primarily attributable to building-related activities such as the direct consumption of natural gas and petroleum products, primarily for heating and cooking needs. Coal consumption was a minor component of energy use in the commercial building sector and did not contribute to any energy use in the residential building sector. Greenhouse gas emissions from commercial and residential buildings increase substantially when emissions from electricity end-use are included, because the building sector uses 75 percent of the electricity generated in the United States (e.g., for heating, ventilation, and air conditioning; lighting; and appliances).[91]

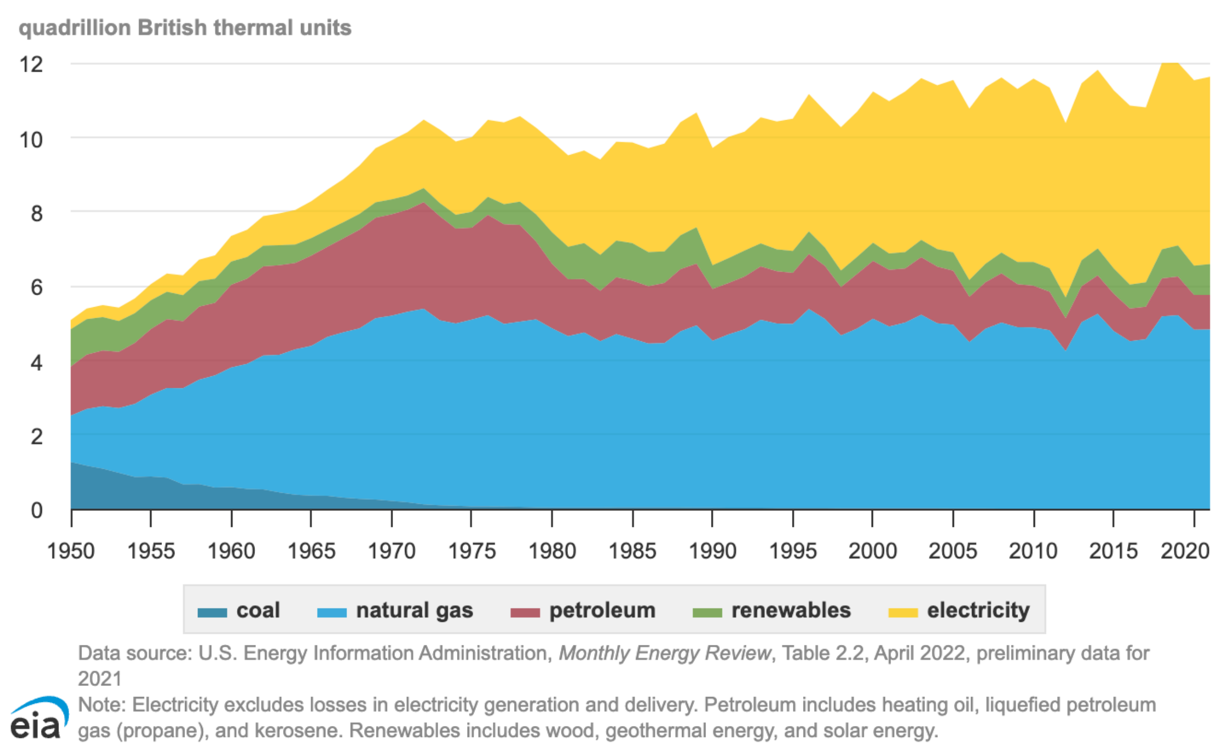
U.S. building sector energy use has remained relatively constant since 2000 and is expected to increase only slightly through 2050. Although 40 million new homes and 60 billion square feet of commercial floorspace are expected to be constructed between now and 2050,[92] standards and incentives are expected to lead to further energy efficiency improvements. Electrification of HVAC, water heating, and other appliances is expected to contribute to additional efficiency and transition a growing number of buildings from on-site combustion to electric power. Distributed solar generation is also becoming more prevalent on residential and commercial buildings.[93]

Residential Buildings

The United States has approximately 123.5 million housing units, with a wide variety of building types, materials, and ages.[94]

Almost all homes in the United States use electricity, and retail electricity accounted for about 44 percent of residential-sector end-use energy consumption in 2020. Natural gas made up another 43 percent of energy end-use. Petroleum products, including heating oil, accounted for another 8 percent, while renewable energy sources made up 5 percent of residential sector energy end-use in 2020 (Figure 3-26).[95]

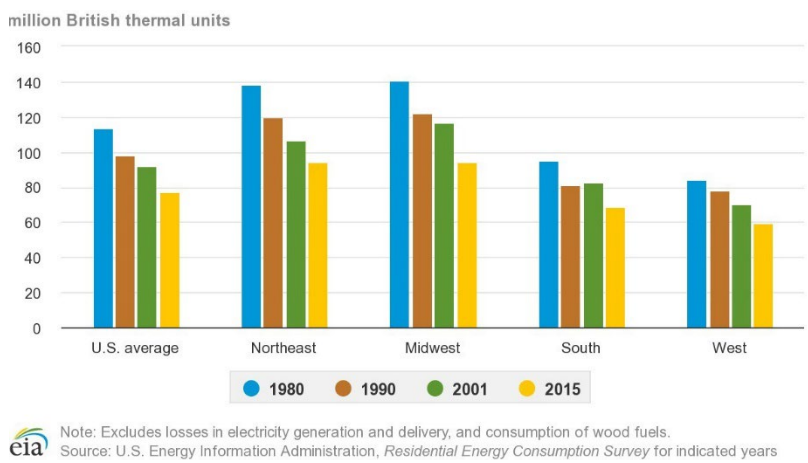
Figure 3-26: U.S. Residential Sector Energy Consumption by Energy Source, 1950-2021



Source: U.S. EIA[96]

While the average U.S. household today uses more air conditioning, appliances, and consumer electronics than ever before, annual site energy use per home has declined (Figure 3-27). This is due to a variety of factors, including improvements in building insulation and materials; improved efficiencies of heating and cooling equipment, water heaters, refrigerators, lighting, and other appliances; and population shifts to regions with lower heating needs. Heating and air conditioning account for about half of home energy use, though this varies by climate zone. Total residential sector energy consumption has remained relatively flat since the mid-1990s, as this declining average energy consumption per household has offset an increasing number of homes overall.[97]

Figure 3-27: Energy Consumption per Household, U.S. Average and by Census Region in Selected Years



Source: U.S. EIA[98]

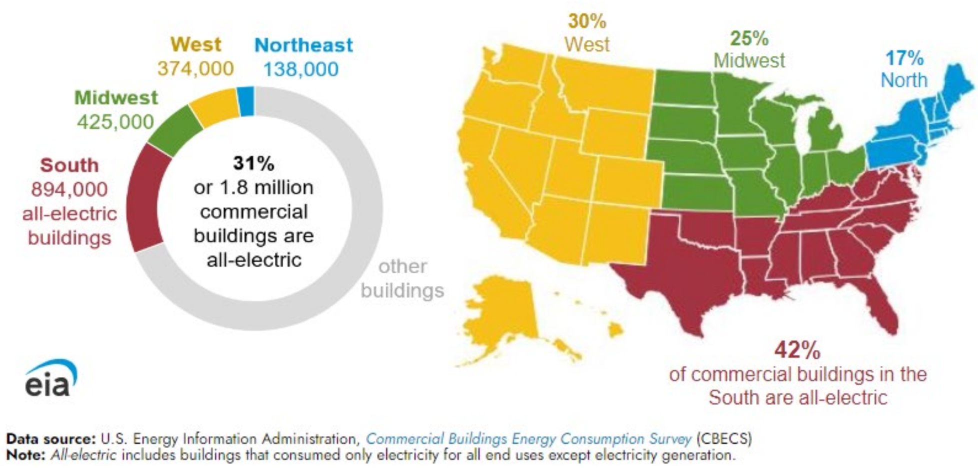
Commercial Buildings

Commercial buildings include a variety of building types – offices, hospitals, schools, police stations, places of worship, warehouses, hotels, and shopping malls. From 1979 to 2018, the latest year for which information was available, the total number of commercial buildings in the United States is estimated to have increased approximately 55 percent (up 6 percent since 2012) to 5.9 million. Total commercial floorspace is estimated to have increased approximately 90 percent (up 11 percent since 2012) to 97 billion square feet.[99] Despite this increase, commercial building energy consumption per square foot of floorspace fell 12 percent between 2012 and 2018, and buildings used primarily for inpatient health care, offices, and education demonstrated statistically significant decreases in total energy intensity.[100]

While commercial floorspace is projected to continue to grow significantly over the next 30 years, total energy use is expected to increase at a much slower space. Wider adoption of commercial building sensors and controls over time – and other factors, including energy efficiency gains and warmer weather – are expected to contribute to declines in commercial energy consumption to meet heating, ventilation, and lighting needs. Commercial buildings are also expected to increasingly electrify HVAC and other appliances, increasing efficiency and replacing on-site fuel combustion.[101]

In 2018, approximately 31 percent of commercial buildings were all-electric, with the largest share of these buildings concentrated in the U.S. South (Figure 3-28). Other energy sources may include solar power, natural gas, fuel oil for space heating, or district chilled water for cooling.[102]

Figure 3-28: U.S. All-Electric Buildings by Census Region (2018)



Source: U.S. EIA[103]

Agriculture

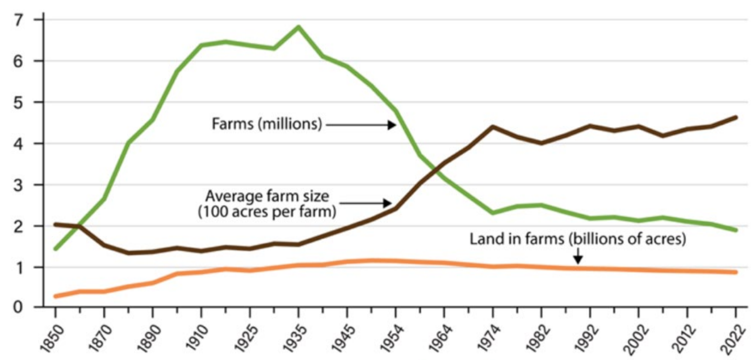
The United States has long been an agricultural powerhouse. U.S. farmers and ranchers produce a vast array of food and fiber crops, feed grains, oil seeds, fruits and vegetables, and other agricultural commodities for both domestic consumption and export. In 2017, 390 million acres of agricultural land were in cropland (a 15 percent decline from 1959); 659 million acres were in grassland, pasture, and range (4 percent more than in 1949); and 132 million acres were in grazed forestland (46 percent less than in 1959).[104]

U.S. agriculture is highly productive due to investments in advanced production techniques, efficiencies, and cultivars and livestock. Agricultural production nearly tripled between 1948 and 2021, while total input (capital, land, labor, and intermediate goods) use declined slightly and land area declined.[105] With U.S. agricultural output growing faster than domestic demand for many products, U.S. farmers and agricultural firms have been relying on export markets to sustain prices and revenues. As a result, U.S. agricultural exports have grown steadily over the past 25 years—reaching $174 billion in 2023, up from $57.3 billion in 1998.[106] Further, the U.S.

agricultural sector is a major source of employment, with average annual jobs on a gradual upward trend over the last decade, rising from 1.11 million in 2012 to 1.18 million in 2020 – a 6 percent increase.[107]

In 2022, there were approximately 1.9 million farms and ranches in the United States, the lowest number since the mid-1800s. Total land in farms also decreased by 2.2 percent from the 2017 agricultural census. This reflects land taken out of cultivation, primarily due to the expansion of settlements; the decline is largely offset by land returning to cultivation from fallow, pasture, and Conservation Reserve Program easements. In the same year, the average farm size increased 5 percent to 463 acres (187 ha), though the size of these operations varies greatly (Figure 3-29).[108] Approximately 88 percent of family farms were classified as small in 2022, with sales of less than \$350,000. Three percent of family farms had incomes of more than \$1 million. Another 2.7 percent of farms were classified as non-family owned.[109]

Figure 3-29: Farm Trends



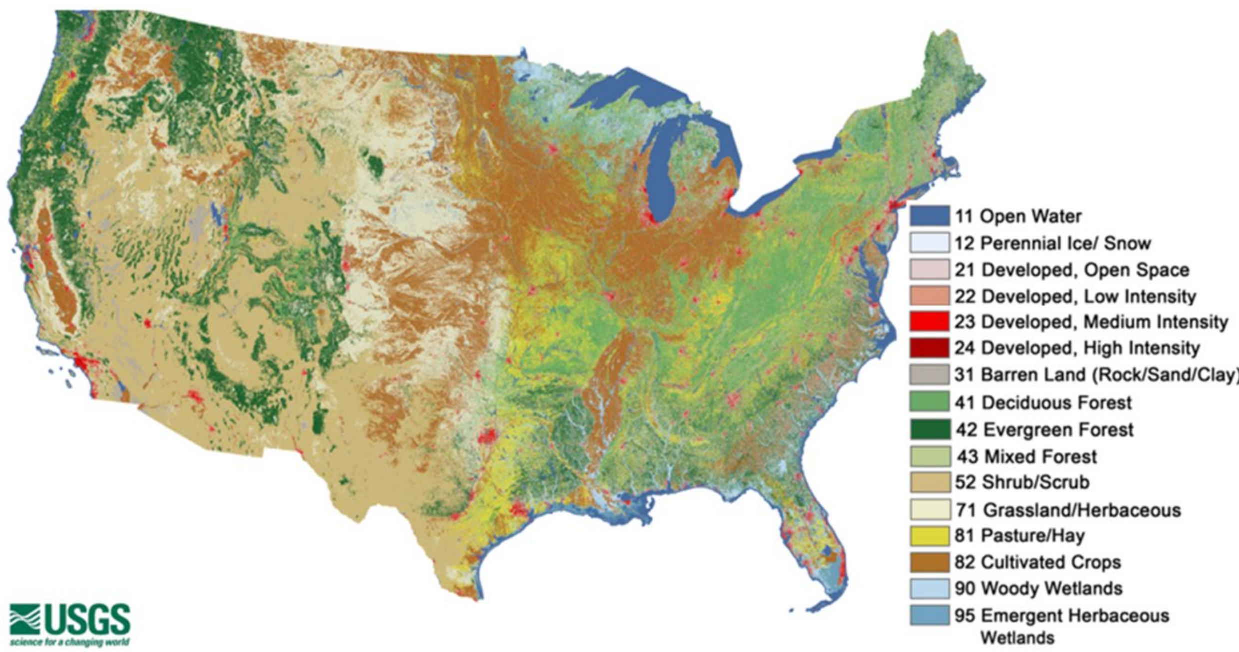
Source: U.S. Department of Agriculture[110]

Emissions from agriculture accounted for approximately 9.4 percent of total U.S. GHG emissions in 2022, a decrease of nearly 2 percent from 2021 levels. Emissions come from several sources, including cultivation, organic soils, nitrogen fertilizer use, enteric fermentation, manure management, and rice production.[111] Enteric fermentation and manure management accounted for nearly 37 percent of U.S. CH_4 emissions in 2022. Agricultural soils were the largest source of U.S. N_2O emissions in 2022, accounting for 75 percent of emissions of this gas due to management activities such as fertilizer application and other cropping practices. However, soils also sequester and store large quantities of carbon, reducing atmospheric CO_2 concentrations.[112] Additional opportunities to reduce agricultural emissions include improving the efficiency of fertilizer use and reducing CH_4 emissions from livestock and rice production.

Land Use, Land Use Change, and Forests

The United States comprises approximately 2,264 million acres (916.2 million ha), spread across a wide range of ecosystems. Land cover varies greatly by region, with deciduous forests predominating in the east, cropland intermixing with deciduous forest in the center of the country, grassland and shrubland mixing with pasture in the Great Plains, and evergreen forest mixing with deciduous on the west coast (Figure 3-30).

Figure 3-30: National Land Cover Database 2023: Conterminous U.S. Land Cover

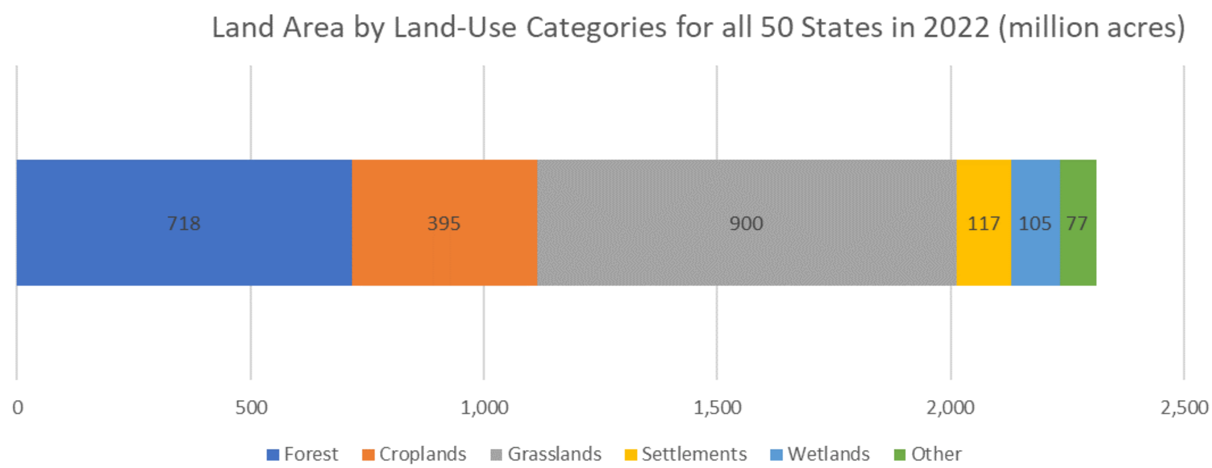


Source: U.S. Geological Survey[113]

Grassland pasture and range makes up the largest share of land use[2] in the United States, followed by forest-use land and cropland. Special-use areas, including wilderness areas, wildlife refuges, and parks, also cover significant acreage (Figure 3-31). Grassland pasture and range increased by 41 million acres (almost 7 percent) between 2007 and 2012, resulting in the highest estimate for this land-use class since 1945. The recent increase more than offsets the 23-million-acre decline in cropland pasture over the same period.[114]

[2] Land use and land cover are related terms, but have different meanings. Land use involves an element of human activity and reflects human decisions about how land will be used. Land cover refers to the vegetative characteristics or manmade constructions on the land's surface

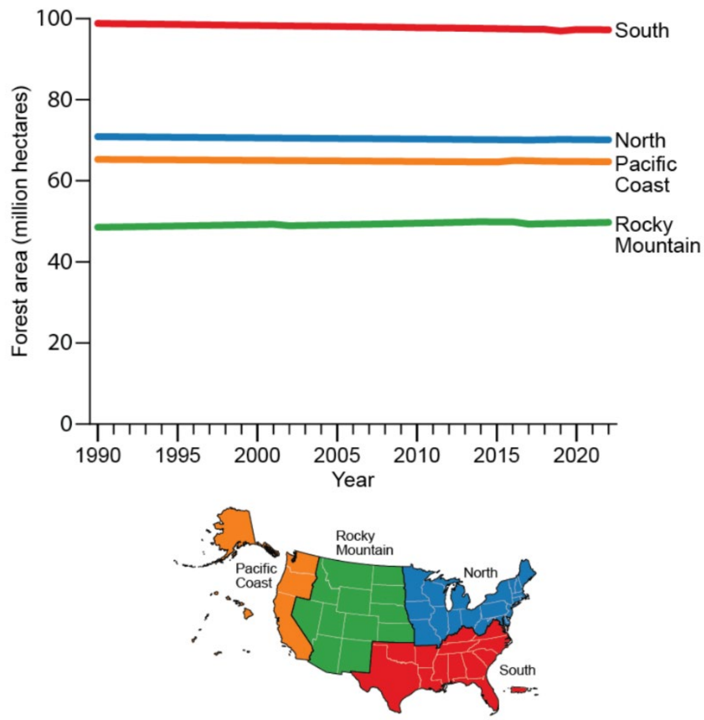
Figure 3-31: Land Area by Land-Use Categories (2022)



Source: U.S. EPA[115]

The United States has approximately 823 million acres (333 million ha) of forests and woodlands,[116] the fourth largest forest area of any country in the world. (Some of these lands are classified as "other areas" in Figure 3-31 above.) This forested area has remained fairly stable since the beginning of the 20th century, even as the population of the country tripled. In recent decades, the area of forest land has even increased slightly though most recently at a decreasing rate: however, recent estimates indicate that this trend could be changing (Figure 3-32). More than half this forest land is privately owned, and much of the Federally-owned forested lands are in the western half of the country.

Figure 3-32: Changes in Forest Area by Region for Forest Land Remaining Forest Land in the Contiguous United States and Alaska 1990-2022



Source: EPA 2024[117]

The forest industry accounts for approximately 4 percent of U.S. total manufacturing GDP each year, producing over $300 billion in products and employing 950,000 people.[118] This figure does not account for recreational uses and other values produced by U.S. forests. Outdoor recreation generates approximately $454 billion in economic activity, accounting for almost 2 percent of U.S. GDP in 2021, and supports nearly 6.1 million jobs nationwide.[119] These numbers do not begin to fully account for the value forests and other U.S. ecosystems provide. For example, forests provide drinking water for 150 million people in the United States.[120] The United States has launched a process to develop statistics for environmental-economic decisions that will help better quantify the value of these ecosystem services in the future.[121]

Another valuable ecosystem service provided by forests is carbon sequestration. In 2022, total net sequestration from land use, land use change, and forests was nearly 922 million metric tonnes of carbon dioxide equivalent (MMT CO_2 eq.), which equates to approximately 14.5 percent of total U.S. GHG emissions. This level of sequestration was a slight increase from 2021.[122] Sequestration was primarily the result of carbon uptake by standing United States forests, forest management, increased tree cover in urban areas, storage in harvested wood products, and the management of agricultural soils. Forest land remaining forest land (including vegetation, soils, and harvested wood) account for the vast majority of total CO_2 removals each year. Other lands converted to forest land and settlements remaining settlements also contributed to substantial net sequestration. The croplands remaining croplands, and settlements remaining settlements categories all contributed to the total net removals in 2022. Estimates of forest-related land use, land use change, and forestry (LULUCF) emissions and removals, with the exception of CO_2 fluxes from wood products and urban trees, are largely calculated based on activity data collected through forest and land-use surveys conducted at multiple-year intervals ranging from 1 to 10 years. The latest *Inventory of U.S. Greenhouse Gas Emissions and Sinks*[123] describes the full methodology.

While forest cover in the United States increased in the last several decades, that historic pattern may change over time. The overall average age of U.S. forests is increasing. As more mature trees actively sequester relatively less carbon over time, this may affect overall storage in forest carbon stocks and rate of sequestration in the long term. Across the United States, the rate of carbon accumulation is the highest in the youngest age classes (0-20 years and 21-40 years) and declines over time (Figure 3-33).[124] Natural disturbances such as wildfires, drought, pest outbreaks, and windthrow may also increase over time, in part due to the effects of climate change, leading to increased tree mortality as well as reduced sequestration ability and the release of carbon immediately or over a period of years. In some regions, older age classes show negative accumulation rates, in some cases related to disturbances.[125] However, regrowth after a disturbance also increases carbon sequestration, especially in the early years after a disturbance. The net impact on emissions over time depends on the specific event, and on subsequent policy responses. Science-based forest management guidelines with opportunities to increase the resiliency of forest carbon in the context of climate change are broadly available across the more than 700 million acres of forest in the United States. However, the adoption of such practices and carbon implications are highly site specific with various nascent efforts across the Federal Government and partners to accelerate associated applied sciences, decision support systems, and landowner support programs.

Figure 3-33: Average Annual Change in Live Aboveground Tree Carbon Stocks by Age Class

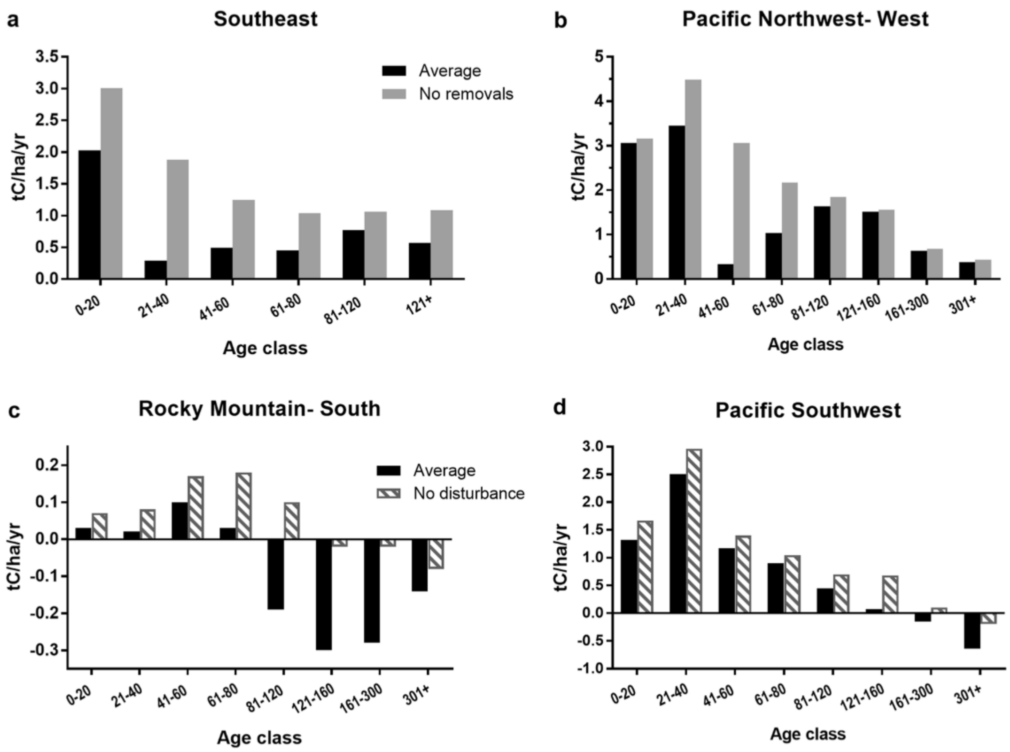


Fig. 3 Average annual change in live aboveground tree carbon stocks (tC/ha/yr) by age class with effect of removing plots with identified removals (harvest) from regional averages in **a** Southeast or **b** Pacific Northwest – West or removing plots with identified disturbances from regional averages in **c** Rocky Mountain – South or **d** Pacific Northwest – West regions

Source: Hoover and Smith[126]

Forests, of course, are not the only ecosystem that sequester carbon in the United States in terms of contributions to emissions reductions and carbon sequestration, as well as the provision of other ecosystem services. Grassland, or prairie, ecosystems comprise approximately 900.2 million acres (364.3 million ha).[127] Many of these grasslands are used for livestock grazing (rangeland), but others remain in their natural state. Privately owned range and pasture lands makes up over 27 percent of the total area of the contiguous 48 states.[128] These grasslands are particularly important stores of carbon in their soils and perennial biomass and serve as habitat for numerous native and migratory species, large and small.

Coastal and inland wetlands, including peatlands, cover approximately 105 million acres (42.5 million ha)[129] of the surface area of the United States. In the past, inland wetlands were occasionally drained for conversion to cropland; today limited conversion of wetlands to settlements may occur along the coasts.[130] Wetlands mitigate climate change by removing GHGs like CO_2 from the atmosphere and storing them in plants and in the soil, and they play a fundamental role in important economic sectors.[131] In 2018, for example, U.S. commercial and recreational fisheries supported 1.7 million jobs and contributed $238 billion in sales.[132]

Wetlands also increase the resilience of coastal communities and businesses to extreme weather events through food and storm protection – estimated to save $23 billion each year[133] – and provide valuable ecological services such as natural water purification.

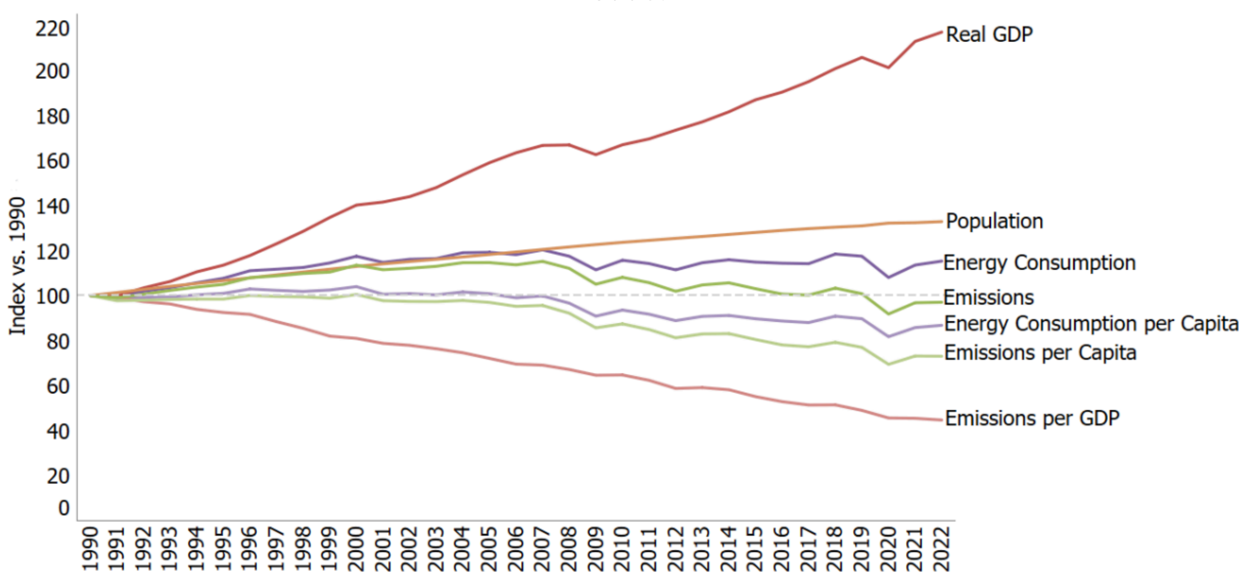
Emission and Removal Trends Over Time

Trends in population growth and density shape energy consumption, land use, transportation, housing density, and other factors that have a significant effect on U.S. GHG emissions.

As very high or low outdoor temperatures require cooling or heating of buildings, annual average temperatures have a correlation to energy use. A mild winter or a cool summer may correspond to lower energy use, and thus to somewhat lower GHG emissions. This is reflected in annual estimates in the NID, discussed in Chapter 2.

Figure 3-34 shows that after 2005, greenhouse gas emissions and total energy use began to peak. Since then, greenhouse gas emissions in the United States have decreased at an average annual rate of 0.9 percent since 2005 while GDP and national population, generally, continued to increase while energy use has decreased slightly – noting 2020 was impacted by the COVID-19 pandemic.[134]

Figure 3-34: U.S. Greenhouse Gas Emissions Per Capita and Per Dollar of Gross Domestic Product



Source: U.S. EPA[135]

U.S. Institutional Arrangements to Track Progress in Implementing and Achieving the U.S. NDC

As described below, the United States uses data from the most recent *Inventory of U.S. Greenhouse Gas Emissions and Sinks* to track progress in implementing and achieving the U.S. NDC.

The U.S. EPA, in cooperation with other U.S. government agencies, prepares the NID, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*. A wide range of agencies and individuals are involved in supplying data to, planning methodological approaches and improvements for, reviewing, or preparing portions of the NID—including Federal and state government authorities, research and academic institutions, industry associations, and private consultants. Detailed institutional arrangements are described in Chapter 2 of this report, and in Section 1.2 (page 1-11) of the NID.

The United States does not currently engage in cooperative approaches under Article 6 of the Paris Agreement; thus, there are no internationally transferred mitigation outcomes (ITMOs) to track or report. The relevant data from the most recent NID, summarized in chapter 2 and the common reporting tables (CRT), and the additional information summarized in this chapter and the corresponding common tabular formats (CTF), is compiled and submitted through the relevant Paris Agreement portals by the U.S. Department of State, and archived in the Department's internal system.

Other Arrangements for Domestic Implementation, Monitoring, Reporting, Verification, and Stakeholder Engagement of the U.S. NDC

Institutional arrangements related to climate action in the United States are described in the previous subsections of this chapter. As noted, authority is shared at a Federal level amongst the executive, legislative, and judicial branches, and by different Federal departments and agencies. State, Tribal, and local governments also share authority within the U.S. Federal system.

The National Climate Task Force was established by Executive Order 14008,[136] "Tackling the Climate Crisis at Home and Abroad," to mobilize the full capacity of the Federal Government to reduce GHG emissions. This Task Force includes the heads of various Federal agencies and departments. Specifically, the Executive Order directs the National Climate Task Force to undertake the following: "The Task Force shall facilitate the organization and deployment of a Government-wide approach to combat the climate crisis. This Task Force shall facilitate planning and implementation of key Federal actions to reduce climate pollution; increase resilience to the impacts of climate change; protect public health; conserve our lands, waters, oceans, and biodiversity; deliver environmental justice; and spur well-paying union jobs and economic growth. As necessary and appropriate, members of the Task Force will engage on these matters with State, local, Tribal, and territorial governments; workers and communities; and leaders across the various sectors of our economy. To the extent permitted by law, Task Force members shall prioritize action on climate change in their policymaking and budget processes, in their contracting and procurement, and in their engagement with State, local, Tribal, and territorial governments; workers and communities; and leaders across all the sectors of our economy."

In April 2021, the United States announced its new NDC to reduce economy-wide net GHG emissions 50-52 percent below 2005 levels in 2030. The National Climate Task Force developed this NDC by using a whole-of-government approach, relying on a detailed bottom-up analysis that reviewed technology availability, current costs, and future cost reductions, as well as the role of enabling infrastructure. Standards, incentives, programs, and support for innovation were all weighed in the analysis. The National Climate Task Force works to implement Federal policies and monitor and evaluate over time how these policies are positioning the United States to achieve its NDC. The National Climate Task Force also supports overarching monitoring and evaluation of GHG mitigation policies, as described later in this chapter.

To support the National Climate Task Force, Executive Order 14008[137] also "established the White House Office of Domestic Climate Policy (Climate Policy Office) within the Executive Office of the President, which shall coordinate the policy-making process with respect to domestic climate-policy issues; coordinate domestic climate-policy advice to the President; ensure that domestic climate-policy decisions and programs are consistent with the President's stated goals and that those goals are being effectively pursued; and monitor implementation of the President's domestic climate-policy agenda. The Climate Policy Office shall have a staff headed by the Assistant to the President and National Climate Advisor (National Climate Advisor) and shall include the Deputy Assistant to the President and Deputy National Climate Advisor. The Climate Policy Office shall have such staff and other assistance as may be necessary to carry out the provisions of this order, subject to the availability of appropriations, and may work with established or ad hoc committees or interagency groups. All agencies shall cooperate with the Climate Policy Office and provide such information, support, and assistance to the Climate Policy Office as it may request, as appropriate and consistent with applicable law." In carrying out these duties, the Climate Policy Office supports monitoring and evaluation of policies and measures over time.

B. Description of the U.S. NDC Under Article 4 of the Paris Agreement, Including Updates

This section describes the U.S. NDC: an economy-wide target of reducing U.S. net greenhouse gas emissions by 50-52 percent below 2005 levels in 2030. This information may also be found in the official NDC communication by the United States,[138] recorded on the NDC Registry.

(a) Target and description: An economy-wide target of reducing U.S. net greenhouse gas emissions by 50-52 percent below 2005 levels in 2030.

(b) Target year: 2030. Single year target.

(c) Base year: 2005.

(d) Time frame and/or periods for implementation: 2030.

(e) Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases: The NDC is economy-wide. It reflects all anthropogenic greenhouse gas emissions and removals as reported in the NID, and specifically:

- All sectors, as defined by the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC 2006 Guidelines);
- All greenhouse gases included in the IPCC 2006 Guidelines;
- All categories, as included in the IPCC 2006 Guidelines, occurring in the United States;
- All carbon pools, as included in Volume 5 of the IPCC 2006 Guidelines.

(f) Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs under Article 4 of the Paris Agreement: At this time, the United States does not intend to engage on a voluntary basis in cooperative approaches referred to in Article 6.2 or the mechanism referred to in Article 6.4 in order to achieve its NDC.

(g) Any updates or clarifications of previously reported information: The national greenhouse gas inventory data used in tracking progress made in implementing and achieving the U.S. NDC described here is that reported in the most recent *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*[139] As described in Chapter II of this Biennial Transparency Report (BTR), this includes recalculations of previously reported inventory data to maintain methodological consistency.

C. Information Necessary to Track Progress Made in Implementing and Achieving the U.S. NDC Under Article 4 of the Paris Agreement

This section describes the information necessary to track progress made in implementing and achieving the U.S. NDC per paragraphs 65-79 of the modalities, procedures, and guidelines for the enhanced transparency framework for action and support referred to in Article 13 of the Paris Agreement (MPGs), as well as the accounting guidance contained in annex II to decision 4/CMA.1 ("annex II"). As this report does not include data on our 2030 target year, we have not reported on paragraph 70 of the MPGs here.

Indicator selected to track progress towards the implementation and achievement of the U.S. NDC under Article 4 (para. 65): U.S. net GHG emissions, as published in the NID on an annual basis.

Indicator information for the 2005 base year (para. 67): U.S. net GHG emissions in 2005 were 6,586.9 MMT CO_2e, per the most recent NID.[140]

Most recent information for the indicator (para. 68) and a comparison of the most recently reported information with the target (para. 69).

	2005	2021	2022	% change since 2005
Net GHG emissions (MMT CO_2e)[141]	6,586.9	5,418.2	5,489.0	-16.7

Accounting approach, including consistency with decision 4/CMA.1- the first Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) (para. 72; paras 1(a) and 2(b) of annex II): The United States applies a net-net accounting approach in accounting for its NDC. Net emissions in the target year will be compared against net emissions in the base year to calculate the percentage emissions reductions achieved.

This accounting approach is consistent with Article 4, paragraph 13 of the Paris Agreement, the inventory guidance contained in the annex to decision 18/CMA.1, and paragraphs 13-17 of the annex II to decision 4/CMA.1. In accordance with IPCC good practice guidance and the guidance included in section II of the annex to decision 18/CMA.1, the U.S. accounting approach utilizes estimates of emissions and removals from the NID. Through this approach, the United States strives for transparency, accuracy, completeness, and consistency, and promotes environmental integrity.

Definitions (para. 73): The definitions, data sources, and models used to estimate net emissions are those described in the most recent NID.

Methodology and accounting approach associated with the NDC target (para. 74(a)): U.S. net economy-wide GHG emissions in the target year (2030), as reported in the most recent NID, will be compared against U.S. net economy-wide GHG emissions in the base year (2005), as reported in the most recent NID, to calculate the percentage emissions reduction achieved.

Methodologies associated with the construction of the baseline (para. 74(b)): Net emissions in the 2005 base year were 6,586.9 million metric tonnes of carbon dioxide equivalent (MMT CO_2 Eq.), as reported in the most recent NID. The NID contains a full description of associated methodologies; these are also summarized in Chapter 2 of this BTR.

Methodologies associated with the indicator (para. 74(c)): U.S. net GHG emissions are published in the NID on an annual basis. The NID reflects all anthropogenic emissions and removals, and specifically:

- All sectors, as defined by the IPCC 2006 Guidelines;
- All greenhouse gases included in the IPCC 2006 Guidelines;
- All categories, as included in the IPCC 2006 Guidelines, occurring in the United States;
- All carbon pools, as included in Volume 5 of the IPCC 2006 Guidelines.

The NID contains a full description of associated methodologies; these are also summarized in Chapter 2 of this BTR.

Key parameters, assumptions, definitions, data sources, and models used (para. 75(a)): The data sources, methodologies, and approaches are those described in the NID, and summarized in Chapter 2 of this BTR. There are no assumptions or parameters associated with the U.S. NDC.

IPCC guidelines used (para.75(b)):

- *2006 IPCC Guidelines for National Greenhouse Gas Inventories;*
- *2006 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands;*
- *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Metrics used (para. 75(c)): 100-year Global Warming Potential values from table 8.A.1 of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, excluding the value for fossil methane.

Accounting for emissions and subsequent removals from natural disturbances on managed lands (para. 75(d)(i), para. 1(e) of annex II): The United States may address emissions and subsequent removals from natural disturbances on managed lands in accounting for its NDC. Should such an approach be used, the same methodology will be applied for both the base year (2005) and target year (2030). The emissions and subsequent removals from such natural disturbances would be included in the national totals of the NID. Any approach used to address emissions and removals from natural disturbances will be consistent with the guidance included in the IPCC 2006 Guidelines and any subsequent version or refinement, as applicable, and will draw on best practices generated by Parties that have addressed natural disturbances under the UNFCCC and the Kyoto Protocol. These include:

- Reporting the CO_2 and non-CO_2 effects of natural disturbances where natural disturbances occur on lands that are subject to land-use change following the disturbance.
- Reporting emissions from salvage logging.
- Reflecting the same methodological approach to addressing natural disturbances in estimations for the base year and the target year.

Accounting for emissions and removals from harvested wood products (para. 75(d)(ii), para. 1(f) of annex II): The United States uses a production approach consistent with the IPCC 2006 Guidelines to estimate emissions and removals from Harvested Wood Products. This is consistent with paragraph 56 of the annex to decision 18/CMA.1. The methodology is described in detail in the NID.

The approach used to address the effects of age-class structure in forests (para. 75(d)(iii)): Not applicable.

Drawing on existing methods and guidance (para. 1(c) of annex II): Reporting the CO_2 and non-CO_2 effects of natural disturbances where natural disturbances occur on lands that are subject to land-use change following the disturbance; reporting on emissions from salvage logging.

Methodologies used to estimate mitigation co-benefits of adaptation actions and/or economic diversification plans (para. 75e)): The U.S. NDC is an economy-wide target of reducing net greenhouse gas emissions and does not include adaptation actions or economic diversification plans.

Methodologies associated with any cooperative approaches that involve the use of internationally transferred mitigation outcomes towards its NDC under Article 4, consistent with CMA guidance on cooperative approaches under Article 6 (para. 75(f)): The U.S. NDC states that, at this time, the United States does not intend to use voluntary cooperation using cooperative approaches referred to in Article 6.2 or the mechanism referred to in Article 6.4 in order to achieve its target.

Methodologies used to track progress arising from the implementation of policies and measures (para. 75(g)): The U.S. NDC does not include the implementation of policies and measures.

Any other methodologies related to its NDC under Article 4 (para. 75(h)): Not applicable.

Any conditions and assumptions relevant to the achievement of its NDC under Article 4 (para. 75(i)): Not applicable.

How the indicator relates to the NDC (para. 76(a)): The U.S. NDC target is an economy-wide target of reducing U.S. net greenhouse gas emissions by 50-52 percent below 2005 levels in 2030. The indicator is U.S. net GHG emissions, as published in the NID on an annual basis. The data on net GHG emissions is used to assess the percentage reductions in net greenhouse gas emissions below 2005 levels, and is directly related to the NDC target.

Methodological consistency (para. 6(b)-(c); para. 2(c) of annex II): The scope and coverage, definitions, data sources, metrics, methodological approaches, and accounting approach reported in this BTR and used to track progress towards implementing and achieving the NDC are the same for each reporting year as reported in the information for clarity, transparency, and understanding (ICTU) communicated with the U.S. NDC. The methodologies for estimating U.S. net GHG emissions are reported in the NID and summarized in Chapter 2 of the BTR. As described above, in the most recent NID and in Chapter 2 of this BTR, the time series includes recalculations of previously reported inventory data to maintain methodological consistency. The net-net accounting approach is described above. There are no methodological inconsistencies.

Methodological changes and technical corrections (para. 2(d)(i) and 2(e) of annex II): As described in the most recent NID and in Chapter 2 of the BTR, the time series includes recalculations of previously reported inventory data to maintain methodological consistency.

Avoidance of double counting (para. 76(d)): By using the NID estimates of net GHG emissions to track progress, the double counting of net GHG emissions reductions has been avoided. Per IPCC guidelines, emissions and removals are only reported once in the NID.   The U.S. NDC states that, at this time, the United States does not intend to use voluntary cooperation using cooperative approaches referred to in Article 6.2 or the mechanism referred to in Article 6.4 in order to achieve its target.

Accounting for all categories of anthropogenic emissions and removals (para 12(c) of decision 4/CMA.1 and paras. 3(a), 3(b), and 4 of annex II): The United States accounts for all anthropogenic emissions and removals as reported in the NID, and specifically:

- All sectors, as defined by the IPCC 2006 Guidelines;
- All greenhouse gases included in the IPCC 2006 Guidelines;
- All categories, as included in the IPCC 2006 Guidelines, occurring in the United States;
- All carbon pools, as included in Volume 5 of the IPCC 2006 Guidelines.

How overestimation or underestimation has been avoided for any projected emissions and removals used for accounting (para. 2(c) of annex II): Projections of emissions and removals are not used in accounting for the United States NDC

Progress in implementing the U.S. NDC

Based on the information reported in the most recent NID,[142] net GHG emissions in 2022 were 16.7 percent below 2005 levels in 2022. As in many countries, 2021 and 2022 reflected an uptick in net emissions in the United States partly as the economy recovered from the COVID-19 pandemic (see Chapter 2 for details), but forest fire emissions in Alaska also played a role. However, preliminary data from the Energy Information Agency[143] suggests that net emissions resumed their downward trend in 2023 despite strong GDP growth. In particular, preliminary estimates for energy-related CO_2 emissions declined by 3 percent in 2023 from the previous year, while CO_2 emissions from transportation sector remained steady. Transportation and energy are the two sectors that contribute the highest level of emissions in the United States.

The downward trajectory in net emissions is expected to accelerate in the coming years, due in large part to the enduring legislation, and other policies and measures put into place to combat the climate crisis (as described in Section D of this Chapter). These include recent actions taken in 2023 and 2024, such as ongoing implementation of the historic Inflation Reduction Act and Bipartisan Infrastructure Law; new executive actions at the Federal level including major regulatory actions to reduce emissions from key sources; and continued efforts from across states, territories, Tribal Nations, local governments, the private sector, and civil society.

As presented in Section F of this chapter, national estimates based on a multi-model approach project that, on the basis solely of measures in place as of May 2024 (i.e., under the "with measures" scenario but without "additional measures" taken between 2024 and 2030), the United States is currently on a track to achieve net GHG emission reductions of 29 to 46 percent below 2005 levels in 2030. More specifically, the “with measures” 2024 Policy Baseline reflects major policies in place as of May 2024, but it does not include all provisions of the Inflation Reduction Act and Bipartisan Infrastructure Law due to modeling limitations and also does not include all subnational efforts.

Section F of this chapter presents a qualitative discussion of the kinds of additional measures that are available across sectors for the achievement of the U.S. NDC target of reducing emissions 50-52 percent below 2005 levels in 2030. The current "with measures" baseline projections of up to a 46 percent reduction, combined with opportunities for additional measures throughout this decade across various levels of government and by the private sector and civil society, put the United States in a strong position to achieve its 2030 NDC.

Structured Summary

	Unit, as applicable	*Reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate (paras. 67 and 77(a)(i) of the MPGs)*	*Implementation period of the NDC covering information for previous reporting years, as applicable, and the most recent year, including the end year or end of period (paras. 68 and 77(a)(ii–iii) of the MPGs)*		*Target level*	*Target year or period*	*Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)*
		2005	**2021**	**2022**			
Indicator(s) selected to track progress of the NDC or portion of NDC under Article 4 of the Paris Agreement (paras. 65 and 77(a) of the MPGs):							
Net GHG emissions	% below 2005 levels	6,586.9	17.7	16.7	50-52	2030	Based on the information reported in the most recent NID, net GHG emissions in 2022 were 16.7 percent below 2005 levels in 2022.
Where applicable, total GHG emissions and removals consistent with the coverage of the NDC (para. 77(b) of the MPGs)	MMT CO_2 equivalent	NA	5,418.2	5,489.0	NA	NA	NA
Contribution from the LULUCF sector for each year of the target period or target year, if not included in the inventory time series of total net GHG emissions and removals, as applicable (para. 77(c) of the MPGs)	NA	NA	NA	NA	NA	NA	NA
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of the NDC, shall provide (para. 77(d) of the MPGs):	NA	NA	NA	NA	NA	NA	NA

MMT = Million Metric Tonnes NA = Not applicable

D. Mitigation policies and measures, actions and plans related to implementing and achieving the U.S. NDC

Introduction

The United States is taking aggressive action to reduce domestic greenhouse gas emissions across sectors, with a prior decade of steady emissions reductions now being followed by a historic set of new investments, standards, and partnerships that will help achieve the U.S. NDC target in 2030. Because of actions taken during the reporting period, the United States is accelerating progress on clean electricity, buildings, industry, and transportation and advancing climate-smart agriculture and forestry, all while providing wide-ranging benefits to communities.

As described in the 2022 U.S. Climate Ambition Report, the United States has mobilized the full capacity of the Federal Government to reduce greenhouse gas emissions while creating good-paying jobs, delivering environmental justice, and protecting public health.[144] The January 2021 Executive Order on Tackling the Climate Crisis at Home and Abroad[145] created new structures and initiatives to drive progress, with the National Climate Task Force[146] bringing together Federal agency leaders to deploy a whole-of-government approach; the Justice40 Initiative[147] working to deliver 40 percent of the overall benefits of Federal climate, clean energy, and related investments to disadvantaged communities; and the Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization[148] working to ensure that communities that have powered the country for generations benefit from job creation, pollution cleanup, and other opportunities provided by the growing clean energy economy.

The 2022 U.S. Climate Ambition Report showcased key steps taken during the first two years of the Biden-Harris Administration, including the enactment of the BIL the IRA, which are providing unprecedented investments in climate solutions across sectors—representing the largest investments in climate action and clean energy in world history. In 2023 and 2024, the United States has made additional progress through new executive actions at the Federal level, ongoing implementation of the BIL and IRA to maximize benefits, and continued efforts from across states, territories, Tribal Nations, local governments, the private sector, and civil society. In 2023 and 2024, the United States has made additional progress through new executive actions at the Federal level, ongoing implementation of the BIL and IRA to maximize benefits, and continued efforts from across states, territories, Tribal Nations, local governments, the private sector, and civil society.

This chapter presents narrative highlights on key actions in each sector, with a focus on new actions taken since the release of the 2022 U.S. Climate Ambition Report. This chapter is accompanied by a table in Annex 1 that provides more details on key Federal actions, policies, and measures that contribute to U.S. emission reductions, including several longstanding Federal efforts that were reported in previous Biennial Reports (BR) and National Communications (NCs). This reporting is not a comprehensive account of every policy and measure that supports U.S. climate goals, but rather a selection of significant efforts underway.

As described in the 2022 U.S. Climate Ambition Report, non-Federal governments—state, local, Tribal, and territorial—are also advancing a range of policies and measures to reduce greenhouse gas emissions. To highlight non-Federal actions, the presentation below of key policies and measures in each sector includes specific examples from state, local, Tribal, and territorial governments. Additionally, several coalitions that are working to increase ambition for non-Federal climate action have issued recent updates on progress, including:

- **The U.S. Climate Alliance**, which brings together governors from states and territories representing more than half the U.S. population to advance state-led, high-impact climate action, issued a 2023 Annual Report that summarizes new state climate actions across GHG targets and governance, buildings, climate finance, electricity generation, industry, just transition and equity, natural and working lands, pricing carbon and valuing damages, resilience, and transportation.[149] The Alliance also launched the online U.S. Climate Alliance Policy Database to provide detailed information on climate action from the Alliance's states and territories.[150]
- **The National Caucus of Environmental Legislators**, which organizes over 1,300 state legislators from all 50 states, issued a 2024 Legislative Session Recap showcasing trends and milestones in state-level environmental policy, including new bills enacted into law in 2024 to decarbonize the transportation system (in 16 states), to reform electric utilities and modernize power grids (in 15 states), to advance the offshore wind industry (in 8 states), and to advance other emerging energy technologies including energy storage, geothermal energy, and hydrogen (in 11 states).[151]
- **The America Is All In coalition,** which mobilizes thousands of U.S. cities, states, Tribal nations, businesses, schools, and faith, health, and cultural institutions in support of climate action, launched an online Federal Climate Funding Hub to help these entities access funding from the BIL and IRA to advance climate solutions and policies.[152]

With current Federal and non-Federal efforts underway, and with additional actions that these efforts can help enable across levels of government, civil society, and the private sector through 2030, the United States is in a strong position to achieve its target of reducing economy-wide greenhouse gas emissions 50-52 percent below 2005 levels in 2030.

Transport

The United States has launched major new initiatives to accelerate decarbonization of the transportation sector. In January 2023, the U.S. Departments of Energy, Transportation, Housing and Urban Development, and EPA issued the *U.S. National Blueprint for Transportation Decarbonization*, a landmark interagency framework of strategies and actions to remove all emissions from the U.S. transportation sector by 2050. The Blueprint identifies key actions before 2030 to help achieve the U.S. NDC, and actions to drive longer-term trends in GHG emissions reductions and help achieve net-zero emissions, with a focus on how transportation-related investments from the BIL and IRA can catalyze efforts by the public and private sector.[153]

Those investments, including a range of grant programs and tax incentives, are catalogued in the 2023 Voluntary Supplement to the 2022 BR,[154] as well as the Summary Table in Annex 1 of this report. These include tax credits that reduce the cost of new or used clean vehicles by thousands of dollars directly at the dealership,[155] as well as funding to build out a national electric vehicle charging network[156]—which will support the goal to have EVs account for at least 50 percent of new passenger vehicles sold by 2030.[157]

Since January 2021, U.S. electric vehicle sales have quadrupled, prices have come down by more than 20 percent, the number of charging stations has grown by over 80 percent – putting the United States on track to deploy 500,000 chargers by 2026 – and the U.S. auto industry has added more than 100,000 jobs. The sector is experiencing a manufacturing renaissance with more than $160 billion of investments in EVs, batteries, and their supply chains.[158]

The Administration is also mobilizing tens of billions of dollars from the BIL and IRA to decarbonize shipping,[159] trucking,[160] transit,[161] rail,[162] and aviation,[163] all while making communities more walkable,[164] bikeable,[165] and connected.[166] The Summary Table in Annex 1 of this report also identifies actions, policies, and measures that influence GHG emissions from international transport.

Recent actions include:

- **Strengthening Emission Standards for Light- and Medium-Duty Vehicles:** In March 2024, EPA announced final greenhouse gas emission standards for passenger cars, light-duty trucks, and medium-duty vehicles for model years 2027 through 2032 and beyond, representing a nearly 50 percent reduction in projected fleet average GHG emissions for light-duty vehicles and a 44 percent reduction for medium-duty vehicles compared to the prior standards for model years 2023 to 2026. The new standards will avoid more than 7 billion tonnes of CO_2 emissions through 2055 and provide nearly $100 billion of annual net benefits to society, including $13 billion of annual public health benefits due to improved air quality, and $62 billion in reduced annual fuel costs, and maintenance and repair costs for drivers.[167]

- **Strengthening Emission Standards for Heavy-Duty Vehicles:** In March 2024, EPA finalized new greenhouse gas emission standards for heavy-duty vehicles for model years 2027-2032. The standards will avoid 1 billion metric tonnes of CO_2 equivalent greenhouse gas emissions from 2027 through 2055 and provide $13 billion in annualized net benefits to society related to public health, the climate, and savings for truck owners and operators. The final standards will also reduce dangerous air pollution, especially for the 72 million people in the United States who live near truck freight routes, bear the burden of higher levels of pollution, and are more likely to be people of color or come from low-income households.[168]

- **Increasing Fuel Economy of Cars and Trucks:** In June 2024, the U.S. Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued new vehicle fuel economy standards that will save Americans more than $23 billion in fuel costs while reducing pollution. Under this final rule, fuel economy will increase 2 percent per year for model years 2027-2031 for passenger cars, and light trucks will increase 2 percent per year for model years 2029-2031. These increases will bring the average light-duty vehicle fuel economy up to approximately 50.4 miles per gallon by model year 2031, saving passenger car and light truck owners more than $600 in fuel over the lifetime of their vehicles. Heavy-duty pickup truck and van fuel efficiency will increase 10 percent per year for model years 2030-2032 and 8 percent per year for model years 2033-2035. This will result in a fleetwide average of approximately 35 miles per gallon by model year 2035, saving heavy-duty pickup and van owners more than $700 in fuel over the lifetime of their vehicles. Together these improved standards will save almost 70 billion gallons of gasoline through 2050, preventing more than 710 million metric tonnes of carbon dioxide emissions by 2050.[169]

- **Investing in Zero-Emission Vehicle Infrastructure and Manufacturing:** In September 2022, the United States announced approvals of Electric Vehicle Infrastructure Deployment Plans submitted by all 50 states, the District of Columbia, and Puerto Rico to access BIL funding to build a convenient, reliable, and affordable EV charging network across the country.[170] Between enactment of the BIL in November 2021 and November 2023, the Administration made $2.4 billion available from the $5 billion National Electric Vehicle Infrastructure Program, with an additional $700 million in competitive grants from the $2.5 billion Charging and Fueling Infrastructure Discretionary Grant Program, as well as $100 million in competitive grants to repair and replace existing but non-operational EV chargers.[171] To support clean vehicle manufacturing, in July 2024 the U.S.

Department of Energy (DOE) announced $1.7 billion to support the conversion of 11 shuttered or at-risk auto manufacturing and assembly facilities, enabling them to manufacture products covering a broad range of the automotive supply chain, including parts for electric motorcycles and school buses, hybrid powertrains, heavy-duty commercial truck batteries, and electric SUVs.[172]

- **Transitioning to a Zero-Emissions Freight Sector:** The U.S. freight system is vital to the nation's economy, with trucks, ships, trains, and planes moving 55 million tons of goods worth more than $49 billion every day. This freight movement represents a significant share of U.S. transportation emissions and is also a major contributor to local air pollution. To address this pollution, in April 2024 the United States announced a first-ever national goal to transition to a zero-emissions freight sector for truck, rail, aviation and marine, along with a commitment to develop a national zero-emissions freight strategy. As part of this commitment, EPA announced a nearly $1 billion funding opportunity for cities, states and Tribes through the IRA to replace Class 6 and Class 7 heavy duty vehicles – which include school buses, trash trucks, and delivery trucks – with zero-emissions vehicles; the U.S. DOT announced the first tranche of its $400 million Reduction of Truck Emissions at Port Facilities Grant Program to improve air quality and reduce pollution for truck drivers, port workers and families that live in communities surrounding ports; and DOE announced a $72 million investment to establish a "SuperTruck: Charged" program that will demonstrate how vehicle-grid integration enables depots and truck stops to provide affordable, reliable charging while increasing grid resiliency.[173]

- **Supporting Transit-Oriented Development:** DOT has long provided a range of support for transit-oriented development—projects that create dense, walkable, and mixed-used spaces near transit to support vibrant, sustainable, and equitable communities. This support has made transit-oriented development a key component of the Housing Supply Action Plan, emphasizing how creating more location-efficient housing units can reduce greenhouse gas emissions from transportation.[174] In October 2023[175] and August 2024,[176] DOT issued new guidance on how the Transportation Infrastructure Finance and Innovation Act (TIFIA) and Railroad Rehabilitation & Improvement Financing (RRIF) programs – which combined have over $35 billion in available lending capacity for transit-oriented development projects at below market interest rates—can be used to finance housing development near transportation, including commercial-to-residential building conversions, with streamlined requirements for closing loans.[177] In April 2024, DOT announced grants for 20 communities in 16 states to support equitable transit-oriented development.[178]

- **Helping States Reduce Transportation Emissions:** In February 2024, DOT certified the strategies that states will use to implement $6.4 billion from the BIL's Carbon Reduction Program to reduce transportation carbon dioxide emissions, including through traffic management, public transportation, pedestrian facilities, alternative fuels, and port electrification.[179] In April 2024, DOT issued a compilation of notable practices from the state carbon reduction strategies, to help states learn from one another as they implement and revise their strategies.[180] In addition to this Federal funding, in November 2023, DOT announced a finalized performance measure that will provide State Departments of Transportation and Metropolitan Planning Organizations a national framework to track transportation-related greenhouse gas emissions, along with the flexibility to set their own targets for reduction.[181]

- **Advancing Sustainable Aviation:** The United States continues to make progress on implementing the U.S. Aviation Climate Action Plan, which in 2021 outlined a whole-of-government approach to achieving a net-zero U.S. aviation sector by 2050.[182] One key effort is the Sustainable Aviation Fuel Grand Challenge, through which the U.S. Departments of Energy, Transportation, Agriculture, and other Federal government agencies are working to scale up new technologies to produce sustainable aviation fuels (SAF) on a commercial scale.[183] U.S. annual SAF production and imports have now grown from 5 million gallons in 2021 to 52 million gallons through the first six months of 2024, and based on a database of active projects, between 2.6 and 4.9 billion gallons per year of SAF may be produced by 2030, creating a clear pathway to achieve the SAF Grand Challenge near-term goal.[184] In April 2024, the U.S. Department of the Treasury and Internal Revenue Service (IRS) released guidance on the SAF credit established by the IRA to incentivize production of SAF that achieves a lifecycle greenhouse gas emissions reduction of at least 50 percent as compared with petroleum-based jet fuel.[185] In August 2024, the Federal Aviation Administration announced $291 million from the IRA for 22 projects that produce, transport, blend or store SAF and for scoping studies related to SAF infrastructure needs as well as 14 projects develop, demonstrate or apply low-emission aviation technologies.[186]

Non-Federal Spotlight

- **State Actions on EVs:** Analysis of state-level activity indicates that in 2023, 49 states plus the District of Columbia took a total of 804 policy and deployment actions related to EVs and charging infrastructure, including through rebates and grant programs, infrastructure planning, and targets for state procurement of EVs. Additionally, all 50 states plus the District of Columbia and Puerto Rico took actions planning for Federal National Electric Vehicle Infrastructure (NEVI) program funding distribution.[187]

- **Transportation Actions in State and Local Climate Action Plans:** The U.S. EPA has developed a Quantified Climate Action Measures Directory[188] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[189] For the transportation sector,[190] this non-comprehensive directory highlights 92 quantified GHG reduction measures from 14 states and the District of Columbia and 96 quantified GHG reduction measures from 21 local governments. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[191] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[192]

- **City Actions on Sustainable Transportation:** A 2024 assessment of decarbonization policies advanced in 75 large U.S. cities found that these cities took 83 new actions in the transportation sector between July 2, 2021 and September 30, 2023, including adopting new sustainable transportation plans; setting new targets for mode shift, electric transit buses, and electric school buses; establishing EV Readiness codes and local ordinances using zoning provisions such as incentivizing affordable housing near transit to reduce transportation emissions; creating new subsidy programs to increase disadvantaged residents' access to low- or no-carbon forms of transportation; and improving energy efficiency of municipal vehicle fleets. Over 30 of these large cities have now adopted goals to reduce transportation GHG emissions or vehicle miles traveled.[193]

- **Accelerating the Electric Vehicle Transition in Cities:** Climate Mayors, a bipartisan network that mobilizes U.S. city leaders committed to climate progress, announced a commitment in August 2024 from nearly 350 U.S. mayors to electrify at least 50 percent of municipal fleets by 2030 while increasing electric vehicle chargers by at least 500 percent, with at least 40 percent of the charging infrastructure benefitting disadvantaged communities. This commitment builds upon the work of the Climate Mayors' Electric Vehicle Pooled Purchasing Collaborative, under which over 250 municipalities, counties, transit agencies, port authorities, and colleges and universities have committed to purchasing over 4,000 EVs.[194]

In addition to these recent highlights, the non-Federal actions referenced in the 2022 U.S. Climate Ambition report (State-Level Low-Emission and Zero-Emission Vehicle Standards, and Low Carbon Fuel Standards) have continued.

Energy: Supply

The United States has set a goal to reach 100 percent carbon pollution-free electricity by 2035, which will eliminate CO_2 emissions from power plants and help decarbonize other sectors as more end uses across transportation, buildings, and industry run on clean electricity. The IRA and BIL contain critical programs to expand clean electricity and reduce emissions from the electric power sector, as catalogued in the 2023 Voluntary Supplement to the 2022 BR, as well as the Summary Table in Annex 1 of this report. Together these provisions are expected to help reduce U.S. electricity-related CO_2 emissions by 72-83% below 2005 levels in 2030, as discussed in Section F of this Chapter. Additionally, these provisions will reduce the cost of future state, Federal, Tribal, local, and private actions to drive towards a 100 percent carbon pollution-free electricity system.[195]

Because of these investments and executive actions, the U.S. electric power sector now has more tools than ever – including unprecedented financial support, efficient permitting, and long-term regulatory certainty – to reduce emissions and upgrade the grid to support more factories, EVs, and other growing sources of electricity demand. Key recent actions include:

- **Setting Greenhouse Gas Emission Standards for Power Plants:** In April 2024, EPA announced a suite of final rules to reduce pollution from new and existing fossil fuel-fired power plants in order to protect all communities from pollution and improve public health without disrupting the delivery of reliable electricity. This suite of actions includes final Clean Air Act standards for existing coal-fired and new natural gas-fired power to limit the amount of carbon pollution covered sources can emit, based on proven and cost-effective control technologies that can be applied directly to power plants. These standards will drive longer-term trends in GHG emissions reductions, with the regulatory impact analysis projecting reductions of 1.38 billion metric tonnes of CO_2 pollution overall through 2047 – which is equivalent to nearly an entire year of emissions from the entire U.S. electric power sector. EPA also projects up to $370 billion in climate and public health net benefits from these standards over the next two decades.[196]
- **Accelerating Permitting of Clean Energy Projects:** The United States has taken historic steps to accelerate and improve the Federal permitting process in order to help build more projects, more quickly across a range of infrastructure types – including projects to generate and transmit clean electricity. These efforts will help realize the full potential

of the IRA and BIL to increase clean energy deployment. Key overarching steps include finalizing a Bipartisan Permitting Reform Implementation Rule to reform, simplify, and modernize the Federal environmental review process under the National Environmental Policy Act[197] and investing $1 billion through IRA funds to hire experts and invest in new technologies to expedite reviews.[198] The United States has also taken actions to improve review processes for specific project types,[199] including DOE's launch of a new Coordinated Interagency Transmission Authorizations and Permits (CITAP) Program to streamline the Federal permitting process for qualifying electric transmission facilities to a two-year timeline.[200]

- **Supporting Expansion of the Power Grid:** The United States is deploying more than $30 billion from the BIL and IRA to invest in the nation's electric grid infrastructure, which must expand in order to achieve decarbonization goals.[201] Alongside these historic investments, in 2024 the Federal Energy Regulatory Commission issued a final rule on Regional Transmission Planning and Cost Allocation, Order 1920, that adopts specific requirements addressing how transmission providers must conduct long-term planning for regional transmission facilities, consider the use of advanced conductors and Grid Enhancing Technologies, and determine how to pay for them, so needed transmission is built.[202] The United States also launched a Federal-State Modern Grid Deployment Initiative in 2024, bringing together states to prioritize efforts that support the adoption of modern grid solutions to expand grid capacity and build modern grid capabilities on both new and existing transmission and distribution lines.[203]

- **Ensuring All Communities Benefit from Clean Energy:** The United States has prioritized ensuring that all communities benefit from clean energy deployment, including the energy communities[204] and workers that have powered our nation for generations and the low-income households that are burdened with high energy bills. For example, EPA announced $7 billion in grant awards in April 2024 through the Solar for All grant competition funded by the IRA. These awards help states, territories, Tribal governments, municipalities, and nonprofits across the country deliver residential solar projects to over 900,000 households in low-income and disadvantaged communities—saving more than $350 million in electricity costs annually, approximately $400 per household.[205] During the 2023 program year of the IRA's Low-Income Communities Bonus Credit Program, this new provision supported more than 49,000 solar facilities that represent $3.5 billion in combined investment and are expected to fund the generation of close to 2 billion kWh of clean electricity each year in underserved places.[206] Additionally, Federal agencies administering a wide range of BIL and IRA funding programs are working to maximize community engagement and equitable benefits, such as through Community Benefit Plans required by DOE.[207]

- **Supporting Clean Energy for Farmers, Rural Small Businesses, and Across Rural Utilities:** The U.S. Department of Agriculture (USDA) is deploying historic funding from the IRA to build electrification infrastructure in rural America with clean, affordable, reliable energy and enhance the quality of life in rural communities. In September 2024, USDA announced more than $7.3 billion in financing for rural electric cooperatives to build clean energy for rural communities, with 16 project selections that will build more than 10 gigawatts of clean energy and deliver cleaner, more affordable and more resilient electricity to approximately 5 million households across 23 states, representing 20 percent of the nation's rural households, farms, businesses and schools.[208] Throughout 2023, USDA used IRA funding to support 4,529 projects that help agricultural producers and rural small businesses invest in renewable energy systems and make energy-efficiency improvements through the Rural Energy for America Program and 14 clean energy projects that serve rural Americans through the Powering Affordable Clean Energy program.[209] DOE is supporting energy improvements in rural and remote areas, by deploying $1 billion from the Bipartisan Infrastructure Law to improve the resilience, reliability, and affordability of energy systems in communities with 10,000 or fewer people.[210]

- **Leading on Federal Lands:** In April 2024, the U.S. Department of the Interior (DOI) announced that it has now permitted more than 25 gigawatts of clean energy projects on Federal public lands – surpassing a major milestone ahead of a 2025 target – including solar, wind and geothermal projects, as well as gen-tie transmission lines on public lands that are essential for connecting clean electricity projects on both Federal and non-Federal land to the grid. The Department also announced a final Renewable Energy rule from the Bureau of Land Management (BLM) that will lower consumer energy costs and the cost of developing solar and wind projects, improve renewable energy project application processes, and incentivize developers to continue responsibly developing solar and wind projects on public lands.[211]

- **Advancing the American Offshore Wind Industry:** In September 2024, DOI approved the nation's tenth commercial-scale offshore wind project, bringing the total capacity approved to more than 15 gigawatts—enough to power 5.25 million homes, and equivalent to half of the capacity needed to achieve the U.S. goal of deploying 30 gigawatts by 2030. Accompanying that announcement, the United States provided updates on actions across Federal agencies to grow the American offshore wind industry, including through offshore wind leasing off every coast, investing in workers and communities, accelerating offshore wind permitting, strengthening transmission and port infrastructure for offshore wind, and advancing floating offshore wind innovation and deployment.[212]

- **Bolstering the American Nuclear Energy Industry:** For decades, nuclear power has been the largest source of clean energy in the United States. The United States has taken a number of actions to support efficient and cost-effective deployment clean, firm nuclear energy, including reviving and revitalizing existing nuclear plants, demonstrating and deploying new nuclear technologies, streamlining licensing processes for building new reactors, and advancing the supply chain and workforce needs, and making investments to establish a more independent nuclear fuel supply.[213] During the World Climate Action Summit of the 28th Conference of the Parties to the U.N. Framework Convention on Climate Change, the United States joined several other countries in launching the Declaration to Triple Nuclear Energy.[214]

Non-Federal Spotlight

- **State Goals for 100 percent Carbon-Free Electricity:** The states of Michigan and Minnesota both enacted legislation in 2023 requiring electric utilities to have portfolios of 100 percent carbon-free electricity by 2040, and the state of Vermont enacted legislation in 2024 to require all Vermont utilities to provide 100 percent renewable energy by 2035, with an earlier 2030 goal for the state's two biggest utilities. There are currently 24 states, in addition to the District of Columbia and Puerto Rico, with 100 percent clean energy goals or requirements, comprising 53 percent of the U.S. population.[215]

- **State Actions on Power Decarbonization, Grid Modernization, and Solar Deployment:** Analysis of state-level activity indicates that in 2023, all 50 states plus the District of Columbia and Puerto Rico took a total of 609 actions related to electric power decarbonization and resource planning[216] and a total of 774 policy and deployment actions related to grid modernization, utility business model and rate reform, energy storage, microgrids, and demand response.[217] Also in 2023, 47 states plus the District of Columbia and Puerto Rico took a total of 273 actions related specifically to distributed solar generation.[218]

- **Electric Power Sector Actions in State and Local Climate Action Plans:** The U.S. EPA has developed a Quantified Climate Action Measures Directory[219] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[220] For the electric power sector,[221] this non-comprehensive directory highlights 40 quantified GHG reduction measures from 13 states and the District of

Columbia and 39 quantified GHG reduction measures from 17 local governments. Through the Climate Pollution Reduction Grant program, EPA has supported updated plans in 2024 from 45 states,[222] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[223]

In addition to these recent highlights, the non-Federal actions referenced in the 2022 U.S. Climate Ambition report (State Renewable Portfolio Standards and Clean Energy Standards, State, Local, and Utility Incentives for Clean Power, and the Regional Greenhouse Gas Initiative) have continued.

Energy: Residential and Commercial End-Use

The United States pursues multiple approaches to reduce the emissions intensity of energy used by residential and commercial buildings, including through building and appliance energy efficiency codes and standards; state-mandated and voluntary energy efficiency and conservation programs; investments in rural energy efficiency; investments in efficient public housing and housing for low-income households; and innovation in grid-interactive technology for high-performance buildings of the future.

The United States has developed a national strategy to reduce greenhouse gas emissions from U.S. buildings by 65 percent by 2035 and 90 percent by 2050, as presented in *Decarbonizing the U.S. Economy by 2050: A National Blueprint for the Buildings Sector*.[224] This April 2024 Blueprint—developed by DOE in collaboration with the U.S. Department of Housing and Urban Development (HUD), EPA, and other Federal agencies—outlines coordinated Federal actions that can support the 2030 NDC and drive longer-term trends in GHG emissions reductions, through work to increase the speed and scale of efforts to increase building energy efficiency, accelerate onsite emissions reductions, transform the interactions between buildings and the electricity grid, and minimize the emissions from producing, transporting, installing, and disposing of building materials.[225]

Central to these efforts, the IRA and BIL contain critical programs to help reduce emissions from residential and commercial buildings in the near-term and for decades to come, as catalogued in the 2023 Voluntary Supplement to the 2022 BR,[226] as well as the Summary Table in Annex 1 of this report.

Recent actions include:

- **Providing Energy Efficiency Tax Credits and Rebates:** In 2023, more than 3.4 million American families benefitted from $8.4 billion in IRA tax credits to lower the costs of clean energy and energy efficiency upgrades to their homes. This includes more than $2 billion claimed for energy-efficient home improvements, such as heat pumps, efficient air conditioners, insulation, windows, and doors, and $6 billion claimed for residential clean energy investments such as solar electricity generation, solar water heating, and battery storage.[227] DOE is also deploying $4.3 billion for Home Efficiency Rebates to discount the price of energy-saving retrofits in single-family and multi-family buildings and $4.5 billion in Home Electrification and Appliance rebates for high-efficiency electricity upgrades in homes, with these IRA rebates being administered by states, territories, and Tribes.[228]

- **Strengthening Energy Efficiency Standards for Appliances and Equipment:** DOE establishes and regularly updates energy efficiency standards for more than 60 categories of appliances and equipment, with covered products representing about 90 percent of U.S. home energy use and 60 percent of U.S. commercial building energy use. In 2023, DOE issued 30 new proposed or final energy efficiency standards – part of a suite of energy efficiency standards that are expected to drive longer-term trends in GHG emissions reductions, by cumulatively reducing greenhouse gas emissions by more than 2 billion metric tonnes CO_2eq and providing nearly $1 trillion in consumer savings over 30 years.[229]

- **Advancing Modern Building Codes:** DOE is deploying $1 billion from the IRA to help states and local governments adopt traditional building energy codes and innovative building energy codes, such as building performance standards, to lead the way in decarbonizing new and existing residential and commercial buildings.[230] In August 2024, DOE announced the first 19 state and local governments that will receive direct technical assistance to support the adoption and implementation of traditional energy codes, zero energy codes, and building performance standards.[231] DOE is also deploying $225 million from the BIL for the Resilient and Efficient Codes Implementation initiative to support modern building energy code adoption, training, and technical assistance at the state and local level.[232] In July 2023, DOE announced the first projects across 26 states and the District of Columbia to receive funding from this initiative to ensure buildings meet the latest standards for energy efficiency.[233]

- **Reducing Emissions Across Federally-Supported Housing:** HUD is implementing a Climate Action Plan that includes advancing energy efficiency and building decarbonization in HUD-supported housing.[234] Recent steps to advance this plan include HUD's December 2023 launch of a free benchmarking service to provide multifamily property owners with data on energy use and water consumption at their properties so they can identify opportunities for energy efficiency improvements,[235] and an April 2024 announcement from HUD and USDA on their adoption of updated Minimum Energy

Standards for new Federally-supported single and multifamily homes – expected to provide energy efficiency improvements of 37 percent that will cut household energy costs by more than $950 per year.[236] HUD is also helping nonprofits, local governments, affordable housing providers, private citizens, Tribes and others understand and access the historic investments from the IRA and BIL through the Build for the Future Funding Navigator,[237] and is deploying Green and Resilient Retrofit Program (GRRP) funding from the IRA to support energy efficiency, renewable energy generation, climate resilience, and low-embodied-carbon materials in HUD-assisted multifamily housing. As of March 2024, HUD has awarded 50 percent of GRRP funding, helping affordable housing communities with projects spanning from targeted upgrades to major net-zero renovation, across 38 states and the District of Columbia.[238]

- **Promoting Voluntary Leadership through Better Buildings:** DOE's Better Buildings Initiative is a market transformation program through which partners collaboratively pursue ambitious energy, waste, water, and greenhouse gas reduction goals. As of October 2023, partnering entities including more than 900 businesses, state and local governments, utilities, housing authorities, and other public and private organizations, to date have collectively saved $18.5 billion through efficiency improvements and cut harmful carbon dioxide emissions by nearly 190 million metric tonnes.[239] DOE also launched the Better Climate Challenge in 2022 to challenge major building portfolio owners and industrial partners to cut their greenhouse gas emissions by 50 percent within 10 years, and in the first year more than 165 partners committed to doing so and averaged more than a 21 percent reduction in GHG emissions from their base year.[240] In April 2024, DOE launched the Better Buildings Commercial Building Heat Pump Accelerator, through which manufacturers will produce higher efficiency and life cycle cost-effective heat pump rooftop units and commercial organizations will evaluate and adopt next-generation heat pump technology.[241]

- **Accelerating Innovation for Building Decarbonization:** In support of the U.S. blueprint for decarbonizing U.S. buildings by 2050 (*Decarbonizing the U.S. Economy by 2050: A National Blueprint for the Buildings Sector*),[242] DOE announced a National Definition of a Zero Emissions Building in June 2024 to provide industry guidance to support new and existing commercial and residential buildings to move towards zero emissions across the entire sector.[243] To provide an important stepping stone toward zero emissions, EPA launched the ENERGY STAR® NextGen™ Certified Homes and Apartments program in May 2024, to recognize homes and apartments with increased energy efficiency; reduced on-site emissions through heat pumps, heat pump water heaters, electric cooking appliances; and residential electric vehicle charging—building on the 30-year legacy of the ENERGY STAR program in helping consumers and businesses make well-informed decisions on energy efficiency.[244] DOE is working through the Affordable Home Energy Shot to accelerate innovative breakthroughs and reduce costs to decarbonize residential buildings, with a focus on building upgrades, efficient electrification, and smart controls, and a goal of reducing the upfront cost of upgrading a home by at least 50 percent while reducing energy bills by 20 percent within a decade.[245]

- **Accelerating Heat Pump Manufacturing:** Following the June 2022 invocation of the Defense Production Act to accelerate U.S. production of five key energy technologies including heat pumps,[246] in November 2023 DOE announced $169 million for nine projects to accelerate U.S. heat pump manufacturing,[247] followed by $85 million announced in August 2024 for four projects to accelerate manufacturing of electric heat pumps, heat pump hot water heaters, and heat pump components.[248]

Non-Federal Spotlight

- **State Heat Pump Deployment Goals:** In September 2023, the U.S. Climate Alliance announced a target from 25 member Governors to collectively reach 20 million heat pump installations across the coalition by 2030, with the aim of ensuring at least 40 percent of benefits flow to disadvantaged communities. This announcement included additional commitments from specific states, across efforts such as zero-emission standards for space and water heating equipment, building performance standards, clean heat standards, building code adoption, and work to phase out fossil fuel heating and cooling in new construction.[249] These commitments build on recent progress, such as how the State of Maine in 2023 surpassed its goal to install 100,000 heat pumps by 2025 – and will now use a Home Energy Rebate Program funded by the IRA to help more households save money on heat pumps.[250]

- **Building Performance Standards Coalition:** Through the National Building Performance Standards Coalition, launched in January 2022, more than 40 state and local governments have committed to inclusively design and implement building performance policies and programs – which require existing buildings to achieve minimum levels of energy or climate performance. Coalition members are supported by Federal agencies, labor, and non-governmental organizations which provide resources for location-based workforce engagement, technical analysis, equity strategies, localized policy design, and stakeholder engagement.[251]

- **Commercial and Residential Buildings Actions in State and Local Climate Action Plans:** EPA has developed a Quantified Climate Action Measures Directory[252] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[253] For the commercial and residential buildings sector,[254] this non-comprehensive directory highlights 56 quantified GHG reduction measures from 14 states and the District of Columbia and 73 quantified GHG reduction measures from 19 local governments. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[255] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[256]

In addition to these recent highlights, the non-Federal actions on Utility Regulation referenced in the 2022 U.S. Climate Ambition report have continued.

Energy: Industrial End-Use and Industrial Processes and Product Use

The United States has identified four key pillars for significantly reducing emissions from the industrial sector, as outlined in the Industrial Decarbonization Roadmap issued the by DOE in 2022, with efforts advancing on energy efficiency; industrial electrification; low-carbon fuels, feedstocks, and energy sources; and carbon capture, utilization, and storage that will support the 2030 NDC and drive longer-term trends in GHG emissions reductions.[257] Beyond the four main pillars, material efficiency (including material substitution, resource conservation, and circular economy strategies) is an important crosscutting decarbonization lever.

These efforts will reduce U.S. emissions from both industrial energy end-use and industrial processes and product use, while at the same time enabling the United States to grow its manufacturing capacity for clean energy technologies—harnessing cleaner steel, aluminum, and concrete to build EVs, clean energy projects, and sustainable transportation infrastructure with an even smaller environmental footprint. As discussed later in this chapter, the United States is also advancing a robust set of actions to reducing methane and hydrofluorocarbon emissions across sectors, including significant contributions to industrial sector emissions reductions.

The United States has taken major strides forward on a comprehensive approach to building a clean industrial sector, including by harnessing the BIL and IRA's new grant programs and tax incentives that can support industrial decarbonization, as catalogued in the 2023 Voluntary Supplement to the 2022 BR,[258] as well as the Summary Table in Annex 1 of this report.

Recent actions include:

- **Investing in Major Industrial Decarbonization Projects:** In March 2024, DOE announced up to $6 billion—funded by the IRA and BIL—across more than 20 states to decarbonize energy-intensive industries, reduce industrial greenhouse gas emissions, support good-paying union jobs, revitalize industrial communities, and strengthen the nation's manufacturing competitiveness. The projects will cut carbon emissions by an average of 77 percent and focus on the highest emitting industries where decarbonization technologies will have the greatest impact, including aluminum and other metals, cement and concrete, chemicals and refining, iron and steel, and more. Many of the projects will deploy first-in-the-nation emissions-reducing technologies that have the potential for sector-wide adoption and transformation, multiplying the magnitude of the expected emissions reductions and supporting the future of U.S. manufacturing.[259]

- **Supporting Low-Carbon Steel, Cement, and More through Federal Procurement:** Since the 2022 launch of the Federal Buy Clean Initiative, Federal agencies have worked to prioritize the use of lower-carbon construction materials—including steel, concrete, asphalt, and flat glass products—in Federal procurement and Federally-funded infrastructure projects. This initiative seeks to reduce the embodied emissions associated with the manufacturing of these materials, as well as other lifecycle stages including extraction and transportation.[260] The U.S. General Services Administration (GSA) announced a pilot in May 2023 of qualification requirements for priority materials with lower levels of embodied carbon emissions,[261] followed by a November 2023 announcement of a $2 billion investment from the IRA for more than 150 Federal construction projects across 39 states, the District of Columbia, and Puerto Rico to use asphalt, concrete, glass, and steel with low embodied carbon.[262] To more broadly improve transparency and disclosure of embodied emissions data associated with construction materials and products, EPA announced in July 2024 the selection of 38 grant recipients to receive IRA funding to develop high-quality environmental product declarations that can catalyze more sustainable purchasing decisions by Federal and non-Federal buyers.[263]

- **Advancing Next-Generation Clean Manufacturing:** The United States is revitalizing American manufacturing to support lower-carbon production of the technologies needed for a net-zero economy. In March 2024, DOE, the Department of the Treasury, and IRS announced the first $4 billion in Qualifying Advanced Energy Project Tax Credits from the IRA for over 100 projects across 35 states to accelerate domestic clean energy manufacturing and reduce GHG emissions at industrial facilities—including projects to implement decarbonization measures across production of chemicals, food and beverage, pulp and paper, biofuels, glass, ceramics, iron and steel, automotive manufacturing, and building materials.[264] In March 2024, DOE announced $425 million in available funding from the BIL's Advanced Manufacturing and Recycling Program to support small and medium-sized manufacturers in current and former coal communities that are focused on producing and recycling clean energy products, as well as investing in decarbonization at their facilities.[265]

- **Promoting Voluntary Leadership:** In 2023, DOE's Better Plants program worked with nearly 300 manufacturers and water and wastewater utilities—representing every U.S. state and territory—to accelerate the adoption of more energy-efficient practices, highlight new and innovative technologies, and spur change at an organizational level.[266] To advance those efforts, in 2023 DOE launched an Industrial Electrification Working Group and issued guidance on electrifying thermal process loads served by fossil-fuel fired systems,[267] created a Funding and Incentives Resource Hub to connect organizations with resources from the IRA and BIL,[268] and created a directory of technical assistance opportunities and industrial technologies reports and analysis.[269]
- **Accelerating Innovation on Key Technologies:** In 2023, DOE selected 104 new projects to receive funding to drive transformational and innovative technologies that will reduce greenhouse gas emissions across the U.S. industrial sector,[270] announced the selection of Arizona State University to lead the seventh Clean Energy Manufacturing Innovation Institute focused on Electrified Processes for Industry without Carbon,[271] and announced investments in 12 state-run programs to make smart manufacturing technologies and high-performance computing more accessible for use across the domestic manufacturing sector[272]—all part of broad efforts across DOE to identify and accelerate the development of the full suite of technologies that will be needed by net-zero manufacturers.[273]

Non-Federal Spotlight

- **"Buy Clean" Policies:** In March 2023, the Federal-State Buy Clean Partnership launched with 12 leading states: California, Colorado, Hawaii, Illinois, Maine, Maryland, Massachusetts, Michigan, New Jersey, New York, Oregon, and Washington.[274] These states have committed to prioritize efforts that support the procurement of lower-carbon infrastructure materials in state-funded projects, and to collaborate with the Federal Government and one another to send a harmonized demand signal to the marketplace. Alongside this announcement, the U.S. Climate Alliance announced the availability of policy, technical, and analytical assistance to help participating members advance their state-level Buy Clean efforts.[275]

- **Industrial Sector Actions in State and Local Climate Action Plans:** EPA has developed a Quantified Climate Action Measures Directory[276] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[277] For the industrial sector,[278] this non-comprehensive directory highlights 44 quantified GHG reduction measures from 10 states and 10 quantified GHG reduction measures from 7 local governments. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[279] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[280]

Agriculture

The United States has long undertaken a range of efforts to reduce greenhouse gas emissions and enhance sequestration related to the use and management of agricultural lands and livestock. Additionally, the United States has launched new initiatives to support U.S. agricultural producers in advancing climate solutions. As highlighted in the 2022 U.S. Climate Ambition Report, USDA is implementing a Climate-Smart Agriculture and Forestry Strategy—directed by the Executive Order on Tackling the Climate Crisis at Home and Abroad—to deliver measurable emissions reductions and carbon sequestration through conservation actions, source sustainable bioproducts and fuels, and decrease wildfire risk fueled by climate change.[281]

Through the IRA, the United States is deploying historic investments to support farmers, ranchers, and forest landowners in deploying climate-smart practices that will reduce greenhouse gas emissions, increase storage of carbon in soils and trees, and make their operations more productive.[282] These provisions are catalogued in the 2023 Voluntary Supplement to the 2022 BR,[283] and included in the conservation program estimates in the Summary Table in Annex 1 of this report.

Recent actions include:

- **Supporting Markets for Climate-Smart Commodities:** Through the Partnerships for Climate-Smart Commodities initiative, USDA is providing grants for pilot projects that create market opportunities for U.S. agricultural and forest products produced using climate-smart practices. USDA announced up to $2.8 billion for 70 selected projects in September 2022[284] and $325 million for an additional 71 projects in December 2022.[285] Together these projects are anticipated to reach more than 60,000 farms, encompassing more than 25 million acres of working land engaged in climate-smart production practices, like cover crops, no-till and nutrient management, as well as pasture and forestry management. The projects will pilot innovative and cost-effective methods for quantification, monitoring, reporting, and verification of greenhouse gas benefits – with the projects currently estimated to sequester more than 60 million metric tonnes of carbon dioxide equivalent over the lives of the projects.[286] USDA has launched a public project dashboard that is being updated periodically. Throughout 2023, USDA's Partnerships for Climate-Smart Commodities Learning Network has convened stakeholders to synthesize lessons learned.[287]

- **Promoting Climate-Smart Practices on Agricultural Lands:** The IRA provides $19.5 billion over five years to help farmers and ranchers implement expanded conservation practices that reduce greenhouse gas emissions and increase storage of carbon in their soil and trees. This funding includes $8.45 billion for the Environmental Quality Incentives Program, $4.95 billion for the Regional Conservation Partnership Program, $3.25 billion for the Conservation Stewardship Program, $1.4 billion for the Agricultural Conservation Easement Program, $1 billion for Conservation Technical Assistance, and $300 million to measure, evaluate, and quantify carbon sequestration and greenhouse gas emission reductions from conservation investments.[288] In 2024, USDA's Natural Resources Conservation Service (NRCS) released an updated list of Climate-Smart Agriculture and Forestry Mitigation Activities eligible for IRA funding in fiscal year 2025, which includes 14 new activities.[289] NRCS also released the NRCS Greenhouse Gas Mitigation Information dashboard sharing the expected mitigation benefits and science-based estimation approach for listed practices.[290]

- **Reducing Methane Emissions from Agriculture:** As highlighted in the December 2023 update to the U.S. Methane Emissions Reduction Action Plan, USDA is deploying multiple strategies to reduce agricultural methane emissions, such as capturing methane emissions from livestock to use as renewable biogas fuel, spurring innovation in animal feed, and improving manure management processes. As of November 2023, USDA has finalized agreements for funding more than $500 million in projects directly focused on methane emissions reduction through the Partnerships for Climate-Smart Commodities initiative. Many of these projects have already started enrolling producers and USDA expects over 1,500 producers to be enrolled this year, encompassing over 1 million acres and over 50,000 head of cattle. In 2023, USDA's Rural Energy for America Program offered more than $43 million in grants to 48 anaerobic digester projects while extending $115 million in loan guarantees for seven biogas projects. Additionally, USDA's Agricultural Research Service is investing over $8 million annually in multi-year methane research projects focused on manure management processes, anaerobic digesters, feed additives and diet formulation, methane measurement, and rice breeding and management practices. USDA's National Institute of Food and Agriculture similarly funded two $5 million research and extension projects in 2023 to reduce enteric methane emissions from beef and dairy production systems. Also in 2023, USDA's Conservation Innovation Grants On-Farm Trials included a focus on reducing enteric methane through feed management and the Regional Conservation Partnership Program invested more than $1 billion in 81 projects across the country, many of which are specifically addressing methane reductions through feed management and manure management. To harness global collaboration, the U.S. State Department is engaging in the Enteric Methane Accelerator—the largest ever research and development effort on cost-effective methane reduction measures in livestock—with the U.S. having committed $10 million in aligned funding to the effort alongside dozens of governments, philanthropies, and private sector participants.[291]

Non-Federal Spotlight

- **Incorporating Indigenous Knowledge and Values into Climate-Smart Agriculture:** More than 20 Tribes and tribal groups are partnering in projects funded by USDA's Partnerships for Climate-Smart Commodities initiative. For example, the Iowa Tribe of Kansas and Nebraska is receiving funding for the "Iowa Tribe Center for Excellence in Regenerative Native Agriculture Innovation Pilot Program," which will test Indigenous agricultural knowledge and techniques and share that knowledge with Native American producers in a multi-state region to reflect climate-smart practices, provide long lasting soil and water health benefits, and expand climate-smart commodity markets.[292] In total, USDA's Partnerships for Climate-Smart Commodities initative has invested $770 million in projects that include tribal lands, covering 47 major commodities and 108 climate-smart and supporting practices.[293]

- **Agriculture Sector Actions in State and Local Climate Action Plans:** EPA has developed a Quantified Climate Action Measures Directory[294] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[295] For the agriculture sector,[296] this non-comprehensive directory highlights 18 quantified GHG reduction measures from 8 states. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[297] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto

Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[298]

- **California Dairy Digester Research and Development Program:** The State of California's Dairy Digester Research and Development Program awards competitive grants to California dairy operations and digester developers for the implementation of anaerobic dairy digesters that result in methane emission reductions on California dairies and minimize or mitigate adverse environmental impacts.[299]

Additionally, the state-level Healthy Soils Initiatives highlighted in the 2022 U.S. Climate Ambition Report have continued.

Land Use, Land Use Change, and Forestry

LULUCF practices contribute greenhouse gas emissions to the atmosphere, but in the United States these emissions have historically been outweighed by the carbon absorbed through forests, vegetation, and soils. In 2022, the net CO_2 removed from the atmosphere from the LULUCF sector was 13 percent of total U.S. greenhouse gas emissions.[300] The United States continues to pursue multiple approaches to reduce gross emissions from the land sector while also growing its capacity to maintain and enhance carbon sequestration.

The United States has taken historic conservation actions, including by protecting more than 40 million acres of lands and waters, through establishing five new national monuments[301] and restoring protections for three more[302]; creating four new national wildlife refuges[303] and expanding four more[304]; protecting the Boundary Waters of Minnesota, the nation's most visited wilderness area[305]; safeguarding Bristol Bay in southwest Alaska[306]; and withdrawing Chaco Canyon in New Mexico[307] and Thompson Divide in Colorado[308] from further oil and gas leasing to protect thousands of sacred sites and pristine lands.

Through the BIL and IRA, the United States is making historic investments in conservation and restoration, including increasing carbon sequestration across U.S. landscapes – as summarized in the 2023 Voluntary Supplement to the 2022 BR,[309] as well as the Summary Table in Annex 1 of this report.

Recent actions include:

- **Advancing the America the Beautiful Initiative:** The United States launched the America the Beautiful initiative in 2021, with the goal of conserving and restoring 30 percent of U.S. lands and waters by 2030 through support of locally led efforts. Since then, the United States has experienced one of the most rapid accelerations of conservation progress in the nation's history. In April 2024, it was reported that the nation is on track to meet this 2030 goal,[310] as indicated by the new American Conservation and Stewardship Atlas that provides a preliminary framework for tracking progress and presenting status and trends of conservation efforts across the country.[311] The United States also launched Conservation.gov, a new website to help connect people with information, tools, resources, and opportunities to support land and water conservation projects in communities across the country.[312]

- **Promoting the Stewardship of Public and Private Forests:** The United States is committed to promoting forest conservation, avoiding deforestation, and restoring and expanding forests that can offset greater carbon pollution. Following the 2022 Executive Order on Strengthening the Nation's Forests, Communities, and Local Economies,[313] the USDA and DOI issued a Mature and Old-Growth Forests report to define these forests and establish their first-ever U.S. inventory, as well as a joint reforestation report with reforestation targets, assessments, and recommendations for increased capacity for seeds and nurseries.[314] USDA also advanced a first-of-its-kind proposal to amend all 128 U.S. forest land management plans to conserve and restore old-growth forests across the National Forest System[315] and launched the Climate Risk Viewer tool to assess climate risks and vulnerabilities on national forests and grasslands.[316] In September 2023, USDA's Urban and Community Forestry Program awarded more than $1 billion across all 50 states and several U.S. territories and Tribal Nations to plant and maintain trees in cities, towns, and suburbs, with support from the IRA.[317] In January 2023, USDA finalized protections for the Tongass National Forest in Alaska, the world's largest intact temperate rainforest.[318]

- **Supporting Nature-Based Solutions:** Following the November 2022 release of the nation's first Nature-Based Solutions Roadmap,[319] the United States issued the Nature-Based Solutions Resource Guide 2.0 to further equip communities and agencies with successful implementation examples, tools, and evidence to advance effective nature-based solutions, and to provide communities with information on potential funding opportunities.[320] Additionally, the Office of Management and Budget released a memorandum to executive branch agencies that, for the first time, guides them to consider nature-based solutions when designing resilient infrastructure, and the U.S. Department of the Interior issued a new policy to prioritize nature-based solutions across its bureaus and offices.[321]

- **Guiding Balanced Management of Public Lands:** In April 2024, DOI issued a final Public Lands Rule to help improve the health and resilience of public lands in the face of a changing climate; conserve important wildlife habitat and intact landscapes; facilitate responsible development; and better recognize unique cultural and natural resources on public lands. This rule recognizes conservation as an essential component of public lands management, on equal footing with other multiple uses of these lands. Building on decades of land management experience and emphasizing the use of science and data, including Indigenous Knowledge, to guide balanced decision-making, the rule establishes restoration and mitigation leases and will help to ensure continued protection of land health while managing other uses of the public lands, such as clean energy development and outdoor recreation.[322]

- **Advancing the Conservation of Sensitive Lands:** The IRA provides $1.4 billion for USDA's Agricultural Conservation Easement Program, which supports farmers and ranchers in conserving wetlands, grasslands, and prime farmlands. In deploying this funding, USDA is prioritizing land that will most reduce, capture, avoid, or sequester carbon dioxide, methane, or nitrous oxide emissions.[323] Additionally, the Conservation Reserve Program (CRP) administered by USDA's Farm Service Agency provides financial incentives to farmers to voluntarily convert environmentally sensitive land from agricultural production to native grasses, wildlife plantings, forested areas, restored wetlands, filter strips, or riparian buffers. The CRP sequesters large amounts of carbon on private lands by removing land from intensive agricultural production and avoiding the application of fertilizer or usage of farm equipment. Since 2021, CRP has grown by 21 percent in terms of acres enrolled, with more than 667,000 participants receiving payments for their voluntary conservation efforts on more than 23 million acres of land as of October 2023.[324]

Non-Federal Spotlight

- **Natural and Working Lands Sector Actions in State and Local Climate Action Plans:** EPA has developed a Quantified Climate Action Measures Directory[325] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[326] For the natural and working lands sector,[327] this non-comprehensive directory highlights 28 quantified GHG reduction measures from 7 states and 13 quantified GHG reduction measures from 8 local governments. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[328] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[329]

- **State and Territory Policies on Land Conservation:** Several U.S. states and territories have taken recent steps on establishing land conservation targets, providing funding for land conservation and related projects from dedicated revenue streams or tax incentives, establishing outdoor equity funds, advancing natural carbon sequestration, creating new state parks and conservation lands, managing state lands held in trust, returning state lands to Tribal nations or co-managing lands with Tribes, supporting wildlife corridors and habitat connectivity, avoiding and mitigating nature loss, and more – as summarized in an April 2024 non-governmental report.[330]

Additionally, the non-Federal actions referenced in the 2022 U.S. Climate Ambition report (Carbon Sequestration Across Tribal Nations, Hawaiʻi 30x30 Initiatives) have continued.

Waste Management

Emissions from the waste sector account for only 2.6 percent of total U.S. greenhouse gas emissions, but make up 20 percent of methane emissions, mostly from landfills.[331] Reducing emissions from landfills, including by preventing food waste, is therefore a pillar of the U.S. Methane Emissions Reduction Action Plan—which includes broader actions across sectors that are summarized in the following Spotlight: Methane section of this chapter.[332]

Recent actions on waste management include:

- **Advancing emissions standards for landfills:** In July 2024, EPA announced it will issue a proposed rule to update its Clean Air Act emission standards for new and existing municipal solid waste landfills in 2025 to cut methane and other harmful landfill gas emissions, including through incorporating new technologies that will better measure and address emissions and reduce harmful air pollution in frontline communities.[333] These updates would follow prior standards finalized in 2016 and a Federal plan finalized in 2021 for existing landfills in areas without a state or Tribal implementation plan.[334]

- **Reducing food loss and waste nationwide:** In June 2024, USDA, EPA, and Food and Drug Administration (FDA) released the "National Strategy for Reducing Food Loss and Waste and Recycling Organics" to prevent the loss and waste of food and increase recycling of food and other organic materials. The strategy drives progress toward the National Food Loss and Waste Reduction Goal to reduce the loss and waste of food by 50 percent by 2030.[335]

- **Investing in local recycling and food waste reduction projects:** In November 2023, EPA announced 59 selectees to receive over $60 million in Solid Waste Infrastructure for

Recycling grants for Tribes and Intertribal Consortia, and 25 selectees to receive over $33 million in Recycling Education and Outreach (REO) grants, funded by the BIL in order to expand recycling infrastructure for Tribal waste management systems across the country and provide public education about local recycling and composting programs.[336] In January 2024, USDA announced $11.5 million for 38 cooperative agreements in 23 states to support innovative, scalable waste management plans to reduce and divert food waste from landfills.[337]

Non-Federal Spotlight

- **Local Zero Waste Initiatives:** Many of the largest U.S. cities including New York City,[338] Los Angeles,[339] Phoenix,[340] Philadelphia,[341] Dallas,[342] Austin,[343] San Francisco,[344] Seattle,[345] Boston,[346] and the District of Columbia,[347] in addition to other cities across the country, have taken recent steps to advance Zero Waste initiatives, aimed at conserving resources and managing materials across product lifecycles in order to avoid any discharges to land, water, or air that threaten the environment or human health.
- **Waste and Materials Management Actions in State and Local Climate Action Plans:** EPA has developed a Quantified Climate Action Measures Directory[348] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[349] For the waste and materials management sector,[350] this non-comprehensive directory highlights 9 quantified GHG reduction measures from 7 states and 36 quantified GHG reduction measures from 14 local governments. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[351] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[352]

Additionally, the non-Federal actions referenced in the 2022 U.S. Climate Ambition report (Reducing Methane Emissions from Landfill Waste, Food Loss & Waste 2030 Champions) have continued.

Spotlight: Methane

In November 2021, the United States issued the Methane Emissions Reduction Action Plan, in support of the Global Methane Pledge goal to reduce global methane emissions 30 percent below 2020 levels by 2030.[353] As further detailed in the December 2023 Methane Action Plan update, U.S. Federal agencies took nearly 100 additional actions in 2023 to reduce methane emissions across sectors.[354]

Highlights of these actions include:

- **Reducing methane emissions and other health-harming pollutants from oil and gas production, while bolstering American innovation, creating good jobs, and advancing energy security:** EPA announced a final Clean Air Act rule to strengthen and update methane emission standards for new, modified and reconstructed sources in the oil and natural gas sector, and to establish guidelines for states to follow in reducing methane from hundreds of thousands of existing sources nationwide. EPA's rule draws on proven and cost-effective solutions deployed by major oil and gas-producing states and leading companies, and it promotes innovation by allowing companies to utilize advanced monitoring technologies to screen for leaks. It also establishes the first national super-emitter response program, which uses state-of-the art technologies to rapidly identify major emission events. EPA anticipates the rule will lead to methane reductions equivalent to 1.5 billion tonnes of CO_2 from 2024 to 2038, reducing emissions from covered sources by 80 percent relative to a "business as usual" scenario. The rule will also protect public health by avoiding 590,000 tonnes of toxic air pollutants and 16 million tonnes of smog-forming volatile organic compounds during this timeframe. These reductions will translate into net climate and health benefits of up to $98 billion, with increased recovery of natural gas valued at up to $13 billion.[355] EPA is also working to implement a Waste Emissions Charge on methane emitted from certain oil and gas facilities in excess of thresholds specified in the IRA, and partnering with DOE to provide $1.36 billion in financial and technical assistance to improve methane monitoring, detection, measurement, and quantification and reduce methane and other greenhouse gas emissions from the oil and gas sector.[356]
- **Detecting and repairing leaks from oil & gas pipelines:** DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) proposed a new rule to significantly improve the detection and repair of leaks from more than 2.7 million miles of natural gas pipelines. The proposed rule would deploy pipeline workers across the country to keep more product in the pipe and prevent dangerous accidents, creating up to $2.3 billion annually in estimated benefits. By updating decades-old Federal standards and requiring advanced leak detection programs, the proposed rule would reduce emissions from covered pipelines by up to 55 percent, with the potential to eliminate up to 1 million metric tonnes of methane emissions in 2030 alone.[357] Additionally, PHMSA announced the award of $392 million in grants in April 2024[358] and $196 million in grants in April 2023[359] to repair or replace old, high risk gas pipes prone to methane leaks across the

country, as part of the $1 billion Natural Gas Distribution Infrastructure Safety and Modernization grant program funded by the BIL.

- **Reducing methane from orphaned oil and gas wells:** DOI is deploying nearly $5 billion funded by the BIL for workers to plug tens of thousands of orphaned oil and gas wells throughout the United States, including $64 million in 2023 for hundreds of improperly abandoned wells on Federal lands, up to $660 million for states to plug thousands of high-priority orphaned wells on state and private lands, and an initial investment of nearly $40 million for Tribal Nations to address orphaned wells on their lands.[360] DOE is deploying $30 million in technical assistance to aid DOI and other Federal agencies, states and Tribal entities in locating, identifying and characterizing undocumented orphaned wells.[361]

- **Reclaiming abandoned coal mines and supporting community revitalization:** The BIL appropriated more than $11 billion over 15 years to eligible states and Tribes to reclaim abandoned coal mines, which will address dangerous safety and environmental conditions, including the elimination of major sources of water and methane pollution. In 2023, DOI made $725 million of this funding available to 22 states and the Navajo Nation, building on the 2022 investment of nearly $725 million.[362] In addition, DOI's Abandoned Mine Land Economic Revitalization program provided another $135 million in grants in 2023 to six Appalachian states and three Tribes to support economic development in former coal communities.[363]

- **Reducing agricultural methane:** USDA has invested more than $500 million to help farmers cut methane emissions under the Partnerships for Climate-Smart Commodities initative.[364] As noted in the Agriculture section above, USDA is also advancing methane reduction efforts including funding anaerobic digester projects, supporting a range of manure management options, advancing feed additives like 3-NOP, and more.

- **Deploying the latest detection technologies to see methane emissions:** The National Aeronautics and Space Administration's (NASA) EMIT Mission on the International Space Station continues to collect high-resolution methane data.[365] These data are validated by a series of aircraft flights in coordination with NOAA and the National Institute for Standards and Technology (NIST), connecting detections from satellite data to specific emissions sources on the ground. NASA's data is free and open to the public and is leading the creation of an online resource to map and track these emission sources. NASA has also been leading efforts to directly compare results from EMIT with other measurement approaches, including with commercial satellite data providers as part of NASA's Commercial Satellite Data Acquisition program.[366]

Non-Federal Spotlight

- **Oil and Natural Gas Systems Actions in State and Local Climate Action Plans:** EPA has developed a Quantified Climate Action Measures Directory[367] with information on certain measures included in state and local climate action plans published between January 2018 and August 2023, as part of a broader set of resources that EPA is providing to advance the goals of the IRA's Climate Pollution Reduction Grant program.[368] For the oil and natural gas systems sector, this non-comprehensive directory highlights 15 quantified GHG reduction measures from 9 states. Through the Climate Pollution Reduction Grant program, EPA has supported updated climate action plans in 2024 from 45 states,[369] dozens of Metropolitan Statistical Areas, more than 200 Tribes, the District of Columbia, Puerto Rico, American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.[370]

Spotlight: Hydrofluorocarbons

HFCs are potent greenhouse gases used in refrigeration and air conditioning equipment, along with several other applications. The American Innovation and Manufacturing (AIM) Act, national legislation enacted in 2020, directs EPA to phase down production and consumption of HFCs in the United States by 85 percent by 2036. This phasedown schedule aligns with the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, which the United States has also ratified. Recent actions to support the HFC phasedown include:

- **Implementing a 40 percent Phasedown Step Starting in 2024** In July 2023, EPA issued a final rule to implement from 2024 through 2028 a 40 percent reduction below a calculated baseline based upon historic HFC production and consumption levels. This final rule builds on the success of the 10 percent phasedown step implemented for 2022 and 2023, by establishing a similar allowance methodology to provide regulatory certainty to industry and stakeholders, ensuring the most efficient implementation under the ongoing phasedown.[371]

- **Facilitating Technology Transitions and Managing HFCs Use and Reuse:** In October 2023, EPA announced a final rule to accelerate the ongoing transition to more efficient and climate-safe technologies in new refrigeration, heating and cooling systems and other products by restricting the use of HFCs where alternatives are already available. A year later, EPA finalized a rule to better manage and reuse existing HFCs, including by reducing wasteful leaks from equipment and supporting a growing American industry for HFC recycling and reclamation.[372] EPA also announced recipients in May 2024 for $15 million in HFC Reclaim and Innovative Destruction Grants from the IRA, for projects that will help increase the amount of HFCs that can be reclaimed and reused in the economy and develop innovative techniques to destroy unusable HFCs.[373]

- **Preventing Illegal Import and Trade of HFCs:** To help ensure the integrity of the program and a rigorous and timely phasedown, EPA and the Department of Homeland Security co-lead an Interagency Task Force on Illegal HFC Trade, in partnership with the Departments of Justice, State, and Defense. The Task Force works to detect, deter, and disrupt any attempt to illegally import HFCs into the United States, and from January 2022 to October 2023 prevented over 1.1 MMT CO_2 eq. of illegal HFC shipments—equivalent to the greenhouse gas emissions from nearly 250,000 gasoline-powered cars in a year.[374] The Task Force continues its mission with additional HFC shipments prevented in 2024.[375] EPA's "Mitigating Climate Change National Enforcement and Compliance Initiative" is using EPA's criminal and civil enforcement authorities to prevent illegal import, production, sale, or distribution of HFCs.[376]

Crosscutting

The United States is undertaking a number of additional actions that help drive GHG emissions reductions across sectors.

Recent cross-cutting efforts include:

- **Supporting Community-Driven Solutions to Cut Climate Pollution:** In July 2024, EPA announced selected recipients of over $4.3 billion in Climate Pollution Reduction Grants from the IRA, for 25 projects across 30 states that target reducing greenhouse gas pollution from six sectors: transportation, electric power, commercial and residential buildings, industry, agriculture/ natural and working lands, and waste and materials management. Many of these projects can be expanded and provide examples that other states, local governments, Tribes, and even businesses can replicate in their work to tackle the climate crisis.[377] This same EPA program is also helping 45 states and dozens of metro areas,[378] Tribes and territories[379] develop Climate Action Plans and is the single largest effort to spur the development of concrete local climate action goals across the nation. Additionally, DOE is using the Energy Efficiency and Conservation Block Grant Program, a $550 million grant program funded through the Bipartisan Infrastructure Law, to assist states, local governments, and Tribes in implementing strategies to reduce energy use, to reduce fossil fuel emissions, and to improve energy efficiency.[380]

- **Mobilizing Private Capital to Deliver Clean Energy and Climate Solutions:** Using funding from the IRA's Greenhouse Gas Reduction Fund, in April 2024 EPA announced three grant awards totalling $14 billion under the National Clean Investment Fund and five grant awards totalling $6 billion under the Clean Communities Investment Accelerator to create a national clean financing network for clean energy and climate solutions across sectors. These eight selected applicants are nonprofit entities that have already supported thousands of individuals, businesses, and community organizations to access capital for climate and clean energy projects. With their awards, selectees will unleash tens of thousands more projects, mobilizing almost $7 of private capital for every $1 of Federal funds, and dedicating over 70 percent of the award amounts toward low-income and disadvantaged communities, ensuring that each public dollar is leveraged for significant private-sector investment. The National Clean Investment Fund selectees will establish national clean financing institutions that deliver accessible, affordable financing for clean technology projects nationwide, and the Clean Communities Investment Accelerator selectees will establish hubs that provide funding and technical assistance to community lenders working in low-income and disadvantaged communities.[381]

- **Launching the American Climate Corps:** In September 2023, the United States launched the American Climate Corps – a workforce training and service initiative that will ensure more young people have access to the skills-based training necessary for good-paying careers in the clean energy and climate resilience economy.[382] The American Climate Corps will mobilize a new, diverse generation of more than 20,000 Americans, while creating pathways to high-quality, good-paying clean energy and climate resilience jobs in the public and private sectors after they complete their paid training program.[383] As of July 2024, there are over 9,000 members of the American Climate Corps serving in communities across the country, hosted by partner organizations that include local nonprofits, Federal agencies, and 13 leading states that have established their own Climate Corps programs.[384] AmeriCorps, the Federal agency for national service, serves as the hub for the American Climate Corps.[385]

- **Helping States, Territories, Tribes, Local Governments, and Non-Governmental Entities Access Funding:** The United States is working to help eligible recipients access the historic funding available from the BIL and IRA to support clean energy and other climate solutions. In addition to advancing a range of ongoing partnerships and engagement efforts, the United States has developed several guidebooks to help explain available funding, including the BIL Guidebook,[386] the IRA Guidebook,[387] the IRA Tribal Guidebook,[388] information on "Direct Pay" provisions from the IRA

- that can enable non-Federal governments and nonprofit organizations to advance clean energy projects,[389] and a Technical Assistance Guide.[390]

- **Enhancing Greenhouse Gas Measurement and Monitoring:** In November 2023, the United States released the National Strategy to Advance an Integrated U.S. Greenhouse Gas Measurement, Monitoring, and Information System, developed by the Greenhouse Gas Monitoring and Measurement Interagency Working Group to enhance coordination and integration of greenhouse gas measurement, monitoring, and information efforts across the Federal government. By increasing coordination and integration of agency efforts into a unified approach for enhancing greenhouse gas information, and bringing to bear the collective capabilities and expertise of agencies to address national needs, this Strategy will ensure that the Federal government is improving our ability to quantify greenhouse gas reduction strategies across all sectors, thereby maximizing the effectiveness of taxpayer resources and advancing efforts to fight the existential threat of climate change. Additionally, the Strategy outlines objectives and near-term focus areas to guide collaboration with external stakeholders on an integrated greenhouse gas information system that disseminates trusted, reliable, transparent, and accurate data.[391]

- **Leading by Example Across Federal Operations:** As the single largest land owner, energy user, and employer in the Nation, the Federal Government is continuing to implement the Federal Sustainability Plan to reduce the Federal Government's GHG emissions by 65 percent by 2030.[392] Recent actions include a June 2023 U.S. GSA announcement of using $975 million in IRA funding to upgrade Federal buildings across the country with emerging and sustainable technologies,[393] the July 2024 GSA and Department of Defense (DoD) announcement of record-setting procurements seeking 100 percent carbon pollution-free electricity,[394] and progress on electric delivery vehicles and charging stations for the United States Postal Service.[395]

- **Financing Projects to Grow the Clean Energy Economy:** The DOE’s Loan Programs Office provides loans and loan guarantees for large-scale, high-impact clean energy and supply chain projects that can support decarbonization across the electric power, transportation, and industrial sectors. The IRA has significantly expanded these loan authorities. Between passage of the IRA in August 2022 and August 2024, the Loan Programs Office achieved over $27 billion in new deals that support a clean energy economy, through conditional commitments and financial closings for projects including electric vehicle battery manufacturing, solar panel manufacturing, clean hydrogen production, a nuclear plant repowering, oil and gas methane emissions monitoring systems, and more.[396]

- **Advancing the U.S. Ocean Climate Action Plan:** In March 2023, the United States issued the nation’s first-ever Ocean Climate Action Plan, a comprehensive U.S. strategy to use the power of the ocean and coasts to address and respond to the changing climate, including through increasing offshore wind and marine energy, decarbonizing the maritime shipping sector, and advancing marine carbon dioxide removal and storage technologies to reduce greenhouse gas emissions, while also conserving and restoring coastal and marine habitats that naturally store carbon.[397] In April 2024, the United States issued a progress update on these efforts,[398] including release of an Ocean Justice Strategy for achieving equitable access to the benefits of a healthy ocean and coastal ecosystem,[399] advancing the decarbonization of the U.S. marine transportation system through a $3 billion investment in clean U.S. ports,[400] and establishing a Fast-Track Action Committee on Marine Carbon Dioxide Removal to evaluate the merits of and concerns about different approaches and share relevant policy and research on safe and effective marine carbon dioxide removal and carbon sequestration.[401]

- **Reducing Plastic Pollution and Waste:** In July 2024, the United States released the first comprehensive, government-wide strategy to target plastic pollution at production, processing, use, and disposal. Mobilizing Federal Action on Plastic Pollution: Progress, Principles, and Priorities outlines existing and new Federal actions to reduce the impact of plastic pollution throughout the plastic lifecycle and calls for sustained and coordinated work with state, local, Tribal, and Territorial governments, local communities, the private sector, and other stakeholders to address the scale and breadth of the plastic pollution challenge.[402] Additionally, the United States announced a new goal to phase out Federal procurement of single-use plastics from food service operations, events, and packaging by 2027, and from all Federal operations by 2035.[403]
- **Supporting Health Sector Emissions Reduction:** On Earth Day 2022, the White House and the U.S. Department of Health and Human Services launched the Health Sector Climate Pledge, a voluntary commitment by private sector healthcare organizations to climate resilience and emissions reduction that includes cutting greenhouse gas emissions by 50 percent by 2030 and achieving net zero emissions by 2050. A group of 139 organizations representing 943 hospitals have signed the Pledge as of April 2024. In addition to hospitals, these stakeholders include health centers, suppliers, insurance companies, group purchasing organizations, pharmaceutical companies, and more. Federal systems like the Indian Health Service, Veterans Health Administration, and Military Health System are working together to meet goals similar to those the private sector organizations have embraced. Combined, this means that over 1,180 Federal and private sector hospitals have made such commitments, together representing over 15 percent of U.S. hospitals.[404]
- **Supporting Sustainable and Healthy Schools:** In April 2024, the United States hosted a White House Summit for Sustainable and Healthy K-12 School Buildings and Grounds[405] and released the 2024 White House Toolkit for Sustainable and Healthy K-12 Schools,[406]

providing an overview of Federal funding, programs, and technical assistance to support schools, teachers, and students in achieving energy efficiency, resilience to extreme weather, and cleaner air, water, and transportation. These include programs like DOE's Renew America's Schools Program, which is providing $500 million to make energy efficiency, clean energy, and clean vehicles accessible for schools across the country,[407] as well as EPA's Clean School Bus Program, which is providing $5 billion through the BIL to replace polluting diesel school buses with zero- and low-emissions models.[408]

- **Advancing Regional Hubs for Clean Hydrogen and Direct Air Capture:** Using funding from the BIL, in October 2023, DOE announced $7 billion to launch seven Regional Clean Hydrogen Hubs that will kickstart a national network of clean hydrogen producers, consumers, and connective infrastructure while supporting the production, storage, delivery, and end-use of clean hydrogen—including in energy-intensive sectors such as chemical and industrial processes and heavy-duty transportation.[409] DOE also announced $1.2 billion in BIL funding in August 2023 to advance the development of two commercial-scale direct air capture facilities in Texas and Louisiana, representing the world's largest-ever investment in engineered carbon removal.[410]

- **Accelerating Innovation for Net-Zero Emissions:** DOE has now launched eight Energy Earthshots™ to drive major innovation breakthroughs in support of net-zero goals—the Carbon Negative Shot, the Clean Fuels & Products Shot, the Enhanced Geothermal Shot, the Floating Offshore Wind Shot, the Hydrogen Shot, the Industrial Heat Shot, the Long Duration Storage Shot, and the Affordable Home Energy Shot.[411] In September 2023, DOE announced $264 million in funding for 11 new Energy Earthshot Research Centers led by DOE National Laboratories and 18 university research teams addressing one or more of the Energy Earthshots™ to tackle scientific challenges.[412] DOE has also issued a series of reports on Pathways to Commercial Liftoff for several emerging technologies that are important to the clean energy transition.[413] These efforts are part of an Administration-wide strategy for accelerating key clean energy technology innovations, as presented in the April 2023 National innovation Pathway Report from the White House Office of Science and Technology Policy, DOE, and the U.S. Department of State.[414]

Please see Annex 1 for a Summary Table providing more details in a tabular format on key Federal actions, policies, and measures that contribute to U.S. emission reductions, including several longstanding Federal efforts that were reported in previous NCs.

E. Summary of Greenhouse Emissions and Removals

In 2022, net U.S. GHG emissions were 5,489 MMT CO_2 Eq., representing a 1.3 percent decrease since 1990 and a 16.7 percent decrease since 2005 (see Table 3-1).

Table 3-1: Recent Trends in U.S. Greenhouse Gas Emission and Sinks (MMT CO_2 Eq.)

Gas/Source	1990	2005	2018	2019	2020	2021	2022
CO_2	**5,131.6**	**6,126.9**	**5,362.2**	**5,234.5**	**4,689.0**	**5,017.2**	**5,053.0**
Fossil Fuel Combustion	4,752.2	5,744.1	4,988.2	4,852.6	4,341.7	4,654.3	4,699.4
Transportation	1,468.9	1,858.6	1,813.1	1,816.6	1,572.8	1,753.5	1,751.3
Electric Power Sector	1,820.0	2,400.1	1,753.4	1,606.7	1,439.6	1,540.9	1,531.7
Industrial	876.5	847.6	810.5	809.8	762.0	780.5	801.1
Residential	338.6	358.9	338.9	342.9	314.8	318.0	334.1
Commercial	228.3	227.1	246.3	251.7	229.3	237.5	258.7
U.S. territories	20.0	51.9	25.9	24.8	23.3	23.8	22.6
Non-Energy Use of Fuels	99.1	125.0	118.4	106.5	97.8	111.6	102.8
Cement Production	33.5	46.2	39.0	40.9	40.7	41.3	41.9
Iron and Steel Production & Metallurgical Coke Production	104.7	70.1	42.9	43.1	37.7	41.9	40.7
Natural Gas Systems	32.4	26.3	32.8	38.5	36.7	35.8	36.5
Petrochemical Production	20.1	26.9	27.2	28.5	27.9	30.7	28.8
Petroleum Systems	9.6	10.2	34.8	45.5	28.9	24.1	22.0
Ammonia Production	14.4	10.2	12.7	12.4	13.0	12.2	12.6
Incineration of Waste	12.9	13.3	13.3	12.9	12.9	12.5	12.4
Lime Production	11.7	14.6	13.1	12.1	11.3	11.9	12.2
Other Process Uses of Carbonates	7.1	8.5	7.9	9.0	9.0	8.6	10.4
Urea Consumption for Non-Agricultural Purposes	3.8	3.7	6.1	6.2	5.8	6.6	7.1
Urea Fertilization	2.4	3.5	4.9	5.0	5.1	5.2	5.3
Carbon Dioxide Consumption	1.5	1.4	4.1	4.9	5.0	5.0	5.0
Liming	4.7	4.4	2.2	2.2	2.9	2.4	3.3
Coal Mining	4.6	4.2	3.1	3.0	2.2	2.5	2.5
Glass Production	2.3	2.4	2.0	1.9	1.9	2.0	2.0
Soda Ash Production	1.4	1.7	1.7	1.8	1.5	1.7	1.7
Titanium Dioxide Production	1.2	1.8	1.5	1.3	1.3	1.5	1.5
Aluminum Production	6.8	4.1	1.5	1.9	1.7	1.5	1.4
Ferroalloy Production	2.2	1.4	2.1	1.6	1.4	1.6	1.3
Zinc Production	0.6	1.0	1.0	1.0	1.0	1.0	0.9
Phosphoric Acid Production	1.5	1.3	0.9	0.9	0.9	0.9	0.8
Lead Production	0.5	0.6	0.5	0.5	0.5	0.4	0.4
Carbide Production and Consumption	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Abandoned Oil and Gas Wells	+	+	+	+	+	+	+
Substitution of Ozone Depleting Substances	+	+	+	+	+	+	+
Magnesium Production and Processing	0.1	+	+	+	+	+	+
Biomass and Biodiesel Consumption[a]	237.9	245.4	336.0	333.1	295.7	303.0	305.4
International Bunker Fuels[b]	103.6	113.3	124.3	113.6	69.6	80.2	98.2
CH_4[c]	**871.7**	**795.4**	**771.5**	**754.3**	**735.3**	**720.5**	**702.4**
Enteric Fermentation	183.1	188.2	196.8	197.3	196.3	196.5	192.6
Natural Gas Systems	218.8	210.1	190.3	188.7	180.3	174.6	173.1
Landfills	197.8	147.7	126.3	128.7	124.1	122.0	119.8
Manure Management	39.1	55.0	67.7	66.7	66.9	66.4	64.7
Coal Mining	108.1	71.5	59.1	53.0	46.2	44.7	43.6
Petroleum Systems	49.4	48.2	59.0	52.2	53.3	48.6	39.6
Wastewater Treatment	22.7	22.7	21.4	21.1	21.0	20.7	20.8
Rice Cultivation	18.9	20.6	19.9	15.6	18.6	18.3	18.9
Stationary Combustion	9.7	8.8	9.6	9.8	8.0	8.0	8.6
Abandoned Oil and Gas Wells	7.8	8.2	8.4	8.5	8.5	8.6	8.5
Abandoned Underground Coal Mines	8.1	7.4	6.9	6.6	6.5	6.3	6.3

Mobile Combustion	7.2	4.3	2.8	2.9	2.5	2.6	2.6
Composting	0.4	2.1	2.5	2.5	2.6	2.6	2.6
Field Burning of Agricultural Residues	0.5	0.6	0.6	0.7	0.6	0.6	0.6
Anaerobic Digestion at Biogas Facilities	+	+	+	+	+	+	+
Carbide Production and Consumption	+	+	+	+	+	+	+
Ferroalloy Production	+	+	+	+	+	+	+
Iron and Steel Production & Metallurgical Coke Production	+	+	+	+	+	+	+
Petrochemical Production	+	+	+	+	+	+	+
Incineration of Waste	+	+	+	+	+	+	+
International Bunker Fuels[b]	0.2	0.1	0.1	0.1	0.1	0.1	0.1
N_2O[c]	**408.2**	**419.2**	**439.5**	**416.4**	**391.2**	**398.2**	**389.7**
Agricultural Soil Management	288.8	294.1	333.4	315.6	292.1	298.0	290.8
Stationary Combustion	22.3	30.5	25.1	22.2	20.5	22.0	24.7
Wastewater Treatment	14.8	18.1	21.2	21.6	22.3	22.1	21.9
Manure Management	13.4	15.2	16.6	16.8	16.9	17.1	17.0
Mobile Combustion	38.4	37.0	17.7	19.1	16.1	16.8	16.7
Nitric Acid Production	10.8	10.1	8.5	8.9	8.3	7.9	8.6
N_2O from Product Uses	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Adipic Acid Production	13.5	6.3	9.3	4.7	7.4	6.6	2.1
Composting	0.3	1.5	1.8	1.8	1.8	1.8	1.8
Caprolactam, Glyoxal, and Glyoxylic Acid Production	1.5	1.9	1.3	1.2	1.1	1.2	1.3
Incineration of Waste	0.4	0.3	0.4	0.4	0.3	0.4	0.3
Electronics Industry	+	0.1	0.2	0.2	0.3	0.3	0.3
Field Burning of Agricultural Residues	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas Systems	+	+	+	+	+	+	0.2
Petroleum Systems	+	+	+	+	+	+	+
International Bunker Fuels[b]	0.8	0.9	1.0	0.9	0.5	0.6	0.8
HFCs	**47.7**	**121.7**	**163.9**	**168.2**	**170.3**	**177.0**	**182.8**
Substitution of Ozone Depleting Substances	0.3	99.5	157.9	162.1	166.2	172.6	178.1
Fluorochemical Production	47.3	22.1	5.7	5.7	3.8	4.0	4.3
Electronics Industry	0.2	0.2	0.3	0.3	0.3	0.4	0.3
Magnesium Production and Processing	0.0	0.0	0.1	0.1	0.1	+	+
PFCs	**39.5**	**10.2**	**7.4**	**7.3**	**6.6**	**6.3**	**6.7**
Fluorochemical Production	17.5	4.0	2.9	3.0	2.5	2.6	3.0
Electronics Industry	2.5	3.0	2.9	2.6	2.5	2.6	2.7
Aluminum Production	19.3	3.1	1.4	1.4	1.4	0.9	0.8
SF_6 and PFCs from Other Product Use	0.1	0.1	0.2	0.2	0.2	0.1	0.2
Substitution of Ozone Depleting Substances	0.0	+	+	+	+	+	+
Electrical Equipment	0.0	+	0.0	+	+	+	+
SF_6	**37.9**	**20.2**	**7.6**	**8.4**	**8.1**	**8.5**	**7.6**
Electrical Equipment	24.7	11.8	5.0	6.1	5.9	6.0	5.1
Magnesium Production and Processing	5.6	3.0	1.1	0.9	0.9	1.2	1.1
Electronics Industry	0.5	0.8	0.8	0.8	0.8	0.9	0.8
SF_6 and PFCs from Other Product Use	1.3	1.3	0.8	0.6	0.5	0.4	0.6
Fluorochemical Production	5.8	3.3	+	+	+	+	+
NF_3	**0.3**	**1.0**	**0.7**	**1.1**	**1.3**	**1.1**	**1.1**
Electronics Industry	+	0.4	0.5	0.5	0.6	0.6	0.6
Fluorochemical Production	0.3	0.6	0.1	0.6	0.7	0.5	0.5
Total Gross Emissions (Sources)	**6,536.9**	**7,494.6**	**6,752.7**	**6,590.1**	**6,001.8**	**6,328.8**	**6,343.2**
LULUCF Emissions[c]	**58.0**	**68.9**	**62.8**	**58.0**	**68.4**	**72.9**	**67.6**
CH_4	53.1	58.5	55.5	52.5	59.3	62.1	58.4
N_2O	4.8	10.3	7.3	5.5	9.1	10.7	9.1
LULUCF Carbon Stock Change[e]	**(1,034.7)**	**(976.6)**	**(978.3)**	**(921.6)**	**(972.8)**	**(983.4)**	**(921.8)**
LULUCF Sector Net Total[f]	**(976.7)**	**(907.7)**	**(915.5)**	**(863.6)**	**(904.4)**	**(910.6)**	**(854.2)**

Net Emissions (Sources and Sinks)	**5,560.2**	**6,586.9**	**5,837.3**	**5,726.6**	**5,097.4**	**5,418.2**	**5,489.0**

+ Does not exceed 0.05 MMT CO_2 Eq.
NO (Not Occurring)
a Emissions from biomass and biofuel consumption are not included specifically in Energy sector totals. Net carbon fluxes from changes in biogenic carbon reservoirs are accounted for in the estimates for LULUCF.
b Emissions from international bunker fuels are not included in totals.
c LULUCF emissions of CH_4 and N_2O are reported separately from gross emissions totals. LULUCF emissions include the CH4 and N_2O emissions reported for peatlands remaining peatlands, forest fires, drained organic soils, grassland fires, and coastal wetlands remaining coastal wetlands; CH_4 emissions from land converted to coastal wetlands, flooded land remaining flooded land, and land converted to flooded land; and N_2O emissions from forest soils and settlement soils.
d Small amounts of PFC emissions from this source are included under HFCs due to confidential business information.
e LULUCF carbon stock change is the net carbon stock change from the following categories: forest land remaining forest land, land converted to forest land, cropland remaining cropland, land converted to cropland, grassland remaining grassland, land converted to grassland, wetlands remaining wetlands, land converted to wetlands, settlements remaining settlements, and land converted to settlements.
f The LULUCF sector net total is the net sum of all LULUCF CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes.
Notes: Total (gross) emissions are presented without LULUCF. Net emissions are presented with LULUCF. Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

F. Projections of Greenhouse Gas Emissions and Removals

Section Summary

This section provides projections of U.S. GHG emissions through 2040, including the effects of policies and measures implemented as of May 2024 in a “With Measures” scenario, hereafter referred to as the “2024 Policy Baseline” scenario.[3] Compared to the Policy Baseline presented in the 2022 BR, the 2024 Policy Baseline includes the 2021 BIL, the IRA, methane standards for the oil and gas sector, updated GHG and fuel economy standards for light, medium, and heavy-duty vehicles, updated energy efficiency standards for appliances in residential buildings, energy efficiency standards for distribution transformers, and GHG standards for fossil fuel fired power plants.

This report uses a multi-model approach, the results of which represent a range of outcomes. In addition to the 2024 Policy Baseline scenarios, we also assessed the impact of four potential ranges of assumptions (sensitivity cases) for oil and gas supply and costs and technology costs. The full 2024 Policy Baseline sees the United States achieving GHG emission reductions of 29 to 46 percent in 2030, 36 to 57 percent in 2035, and 34 to 64 percent in 2040, relative to 2005 levels (Table 3-2).

[3] The 2024 Policy Baseline scenario does not include the full effects of legislation in the process of implementation, nor plans or programs in the process of implementation by the Biden administration.

This report does not include a “With Additional Measures” scenario. The large effects of the policies and measures included in the 2024 Policy Baseline scenario, particularly the recent IRA and BIL, make it difficult to model the impacts of additional policy while these existing policies are being implemented. While a “With Additional Measures” scenario was not modeled, this section does present a qualitative discussion of the kinds of additional measures needed to achieve the U.S. NDC of reducing GHG emissions by 50-52% by 2030, relative to 2005 levels.

Additionally, this report does not include a “Without Measures” scenario. Modeling a “Without Measures” scenario is difficult due to the large number of mitigating policies and measures implemented over the past several decades. Instead, we have provided a comparison of the 2024 Policy Baseline with projections of “With Measures” scenarios reported in previous NCs and BRs. This illustrates the additional progress made from policies implemented after each reporting period.

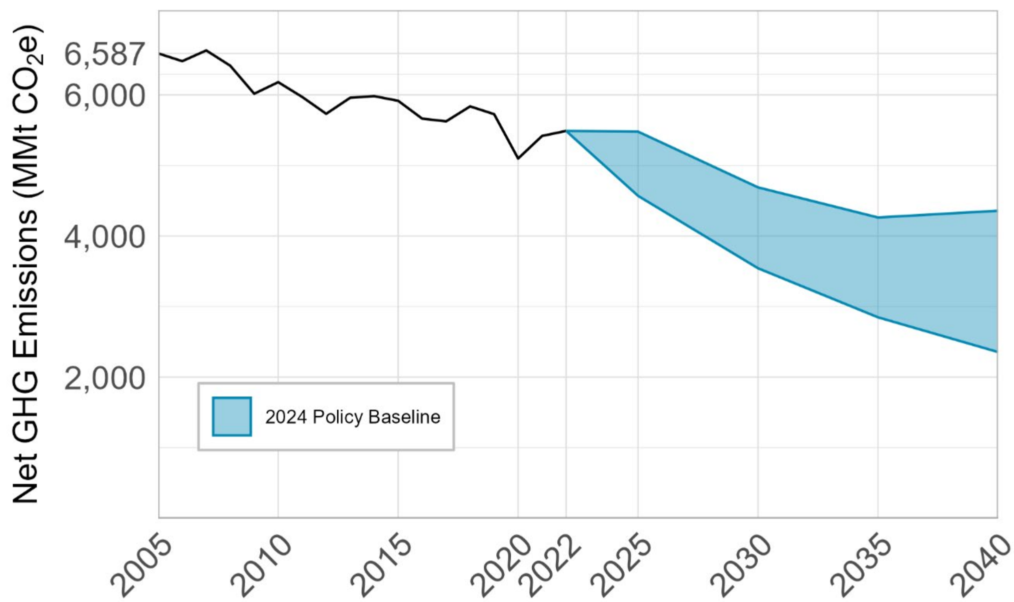
See Annex 3 for an explanation of the methodology used for this section on projected GHG emissions, including information on key underlying factors and activity data.

Projections for the 2024 Policy Baseline

The projections of U.S. GHG emissions described here in the 2024 Policy Baseline reflect national estimates considering future potential population growth, long-term economic growth, ongoing evolution of the energy system, and many of the implemented policies and measures discussed earlier in this chapter (see Figure 3-35). Annex 3 includes a detailed explanation of the methodology used for this section on projected GHG emissions.

The 2024 Policy Baseline scenario includes the BIL and IRA, as well as the effects of even more recent policies and measures finalized and implemented in 2023 and through May 2024. While many IRA and BIL provisions are represented in the modeling, several are not implemented due to modeling limitations. These are outlined in the accompanying methodology in Annex 3. In addition to this core policy implementation, four additional sensitivity cases were modeled for energy CO_2 emissions to reflect uncertainty in the trajectories of technology costs and oil and gas supply.[4, 5] This full set of five scenarios forms the 2024 Policy Baseline range in this report.

Figure 3-35: U.S. Net GHG Emissions Projections



Notes: The 2024 Policy Baseline range reflects the ranges across projections of energy-related CO_2 emissions and LULUCF modeling.

Greenhouse Gas Emission Trends Under the 2024 Policy Baseline

Historical emissions are taken from the NID. Projections of energy-related CO_2 emissions are taken from three economy-wide energy system models.[6] The EPA prepared projections of non-

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[4] The oil and gas supply sensitivity follows the "low oil and gas supply" and "high oil and gas supply" side cases in the U.S. Energy Information Administration (EIA) Annual Energy Outlook 2023 (AEO2023). These side cases assume a 50% lower (higher) oil and gas resource recovery and 50% higher (lower) drilling costs than the reference scenario.

[5] The advanced technology costs sensitivity includes implementation of the "Advanced" scenario from the National Renewable Energy Laboratory (NREL) 2023 Annual Technology Baseline (ATB2023), as well as higher credit values for clean electricity and vehicle credits. Scenario implementation varies by model; all methodologies can be found in Annex 3 of this report.

[6] These three models are: i) the Global Change Analysis Model (GCAM) from the Pacific Northwest National Laboratory, ii) the USREP-ReEDS model from the MIT Joint Program on the Science and

energy-related CO_2 emissions and non-agricultural-related non-CO_2 emissions. USDA prepared projections on agricultural CO_2 and non-CO_2 emissions. The U.S. Forest Service, USDA, and EPA collaborated on projections of net fluxes from LULUCF. Methods used to project energy-related CO_2 emissions, non-energy-related CO_2 emissions, non-CO_2 emissions, and net fluxes from LULUCF are presented in Annex 3. Historical emissions and projections are presented by gas in Table 3-2 and by sector in Table 3-3.

Trends in Total Greenhouse Gas Emissions

In the 2024 Policy Baseline, U.S. net GHG emissions are projected to decline by 29 to 46 percent in 2030, 36 to 57 percent in 2035, and 34 to 64 percent in 2040, relative to 2005 levels (Table 3-2). Between 2005 and 2022, net GHG emissions declined 16.7 percent.

Table 3-2: Historical and Projected (2024 Policy Baseline) U.S. Greenhouse Gas Emissions by Gas: 2005-2040 (MMT CO_2 eq.)

	Historical					Projected			
Gas	2005	2010	2015	2020	2022	2025	2030	2035	2040
CO_2	6,127	5,669	5,368	4,689	5,053	4,282 - 5,011	3,390 - 4,275	2,926 - 3,940	2,651 - 4,107
CH_4	795	808	764	735	702	639	597	577	567
N_2O	419	418	427	391	390	390	381	378	376
HFCs	122	152	161	170	183	123	82	64	49
PFCs	10	7	7	7	7	8	11	14	17
SF_6	20	12	8	8	8	9	11	13	16
NF_3	1	1	1	1	1	2	3	4	5
Total Gross Emissions	7,495	7,066	6,736	6,002	6,343	5,451 - 6,181	4,475 - 5,360	3,976 - 4,990	3,680 - 5,136
LULUCF Sink	(908)	(886)	(820)	(904)	(854)	(883) - (702)	(933) - (671)	(1,129) - (728)	(1,324) - (779)
Total Net Emissions	6,587	6,180	5,916	5,098	5,489	4,569 - 5,479	3,543 - 4,689	2,848 - 4,262	2,356 - 4,358

Notes: Carbon dioxide emissions, Total Gross Emissions, LULUCF Sink, and Total Net Emissions are presented as a range between minimum and maximum values of multi-model "With Measures" scenario results. Parentheses indicate negative values or sequestration.

Policy of Global Change and the National Renewable Energy Laboratory, and iii) the U.S. Department of Energy Office of Policy's National Energy Modeling System model (OP-NEMS).

Table 3-3: Historical and Projected (2024 Policy Baseline) U.S. Greenhouse Gas Emissions by Sector: 2005-2040 (MMTCO$_2$e)

	Historical					Projected			
Sector	2005	2010	2015	2020	2022	2025	2030	2035	2040
Energy	4,450	4,190	3,838	3,271	3,429	2,702 - 3,305	2,093 - 2,645	1,868 - 2,508	1,781 - 2,581
Transportation	1,900	1,730	1,742	1,591	1,771	1,683 - 1,867	1,334 - 1,743	1,051 - 1,643	870 - 1,581
Industrial Processes	371	365	370	368	383	321	289	279	282
Agriculture	582	599	615	600	593	579	593	593	593
Waste	192	183	172	172	167	164	161	158	154
Total Gross Emissions	7,495	7,066	6,736	6,002	6,343	5,451 - 6,181	4,475 - 5,360	3,976 - 4,990	3,680 - 5,136
LULUCF Sink	(908)	(886)	(820)	(904)	(854)	(883) - (702)	(933) - (671)	(1,129) - (728)	(1,324) - (779)
Total Net Emissions	6,587	6,180	5,916	5,098	5,489	4,569 - 5,479	3,543 - 4,689	2,848 - 4,262	2,356 - 4,358

Notes: Energy, Transportation, and LULUCF Sink-related emissions are presented as a range between minimum and maximum values of multi-model "With Measures" scenario results. The minimum and maximum values presented for the Energy and Transportation sectors do not necessarily come from the same model and therefore may not sum to Total Gross Emissions. Parentheses indicate negative values or sequestration. Transportation emissions and emissions for industrial processes represent direct emissions only.

Emissions Projections and Trends by Sector

Energy

Emissions from the energy sector include fuel combustion associated with buildings, electricity generation, and industry, as well as emissions associated with fuel production. Transportation emissions are discussed separately. Gross greenhouse gas emissions from the energy sector are projected to decline from 2023 through 2040 across all models, reaching reductions of 41 to 53 percent in 2030, 44 to 59 percent in 2035, and 42 to 60 percent in 2040, relative to 2005 levels (Table 3-3). Energy-related CO_2 emissions decline 40 to 53 percent in 2030, 42 to 59 percent in 2035, and 40 to 60 percent in 2040, relative to 2005 levels.

Reductions are driven by accelerated deployment of clean energy and the phase-down of emissions-intensive, coal-based electricity generation, due to regulations and enhanced by tax incentives, as well as CH_4 emission reductions from regulations targeting emissions in the oil and gas sector. Increased electrification of transportation and buildings, energy efficiency, and development of sustainable fuels (e.g., clean hydrogen), due to tax incentives, are projected to play a role in emissions reductions. Energy-related CH_4 emissions are projected to decline 49 percent in 2030, 54 percent in 2035, and 56 percent in 2040, relative to 2005 levels.

Figure 3-36: Historical and Projected CO_2 Emissions in the Energy and Transportation Sectors (2005-2040)

Notes: This figure includes energy and transportation related CO_2 emissions. The range reflects differences across the three models used to evaluate energy-related CO_2 emissions.

Electricity

Electricity-related CO_2 emissions are projected to decline 72 to 82 percent in 2030, 75 to 89 percent in 2035, and 76 to 90 percent in 2040, relative to 2005 levels. Electricity generation and capacity are projected to grow significantly through 2040 due to electrification in end-use sectors and increased demand for services, including through increased industrial activity. Through 2040, solar and wind generation are projected to contribute an increasing percentage of electricity generation, 49 to 72 percent, as conventional coal and natural gas generation decreases. Renewable generation ranges from 54 to 76 percent of total generation, and carbon-pollution-free generation between 76 and 89 percent. Electrical transmission and distribution networks are also expected to grow substantially over the next decade to support the increase in demand. This growth has the potential to drive increases in emissions of sulfur hexafluoride.

Incentives from the IRA, federal regulations, state clean electricity policies, and declining technology costs are projected to drive increased deployment of clean electricity sources.

Notably, the IRA included key clean electricity tax credits (e.g., the Production Tax Credit and Investment Tax Credit) described further in Annex 3. This progress is further bolstered by updated power plant regulations, finalized by EPA in 2024, which set carbon pollution standards for existing coal-fired and new gas-fired power plants. These standards will require that all coal-fired plants that plan to run in the long-term and all new baseload gas-fired plants control 90 percent of their carbon pollution, a level based on application of carbon capture and sequestration (CCS) as an available and cost-reasonable emission control technology.

Industry

Industry-related CO_2 emissions from fossil-fuel combustion are projected to decline from 2005 levels by 2 to 27 percent in 2030, range from a 31 percent decline to a 7 percent increase in 2035, and range from a 33 percent decline to a 33 percent increase in 2040, relative to 2005 levels. Including indirect emissions from electricity, emissions are projected to decline 36 to 53 percent in 2030, 35 to 57 percent in 2035, and 25 to 59 percent in 2040, compared to 2005 levels. The large later year range in industrial CO_2 emissions is due to the uncertainty of CCS adoption in the sector after the 45Q Tax Credit for CCS expires. Increased macroeconomic activity, including onshoring and the general expansion of the U.S. industrial base, lead to higher projections of industrial output through 2040. This increased output is anticipated to be met through fossil fuels with CCS, but also increasing levels of cleaner electricity and sustainable fuels, such as biofuels and clean hydrogen. Energy efficiency improvements in several industrial sectors are projected to reduce energy demand growth through 2040.

Carbon capture presents unique emission reduction opportunities in the industrial sector. The IRA expanded and extended the 45Q Tax Credit for CCS. Some of the largest impacts of the 45Q credit on industrial emissions are in iron and steel, cement, and ethanol production. Additional support is provided through the BIL for direct air capture demonstrations; this funding will result in the development of 4 direct air capture hubs that have a capacity of at least 4 MMT of CO_2 capture per year.

The use of hydrogen to meet energy demand is also projected to aid in industrial emissions reductions. The IRA 45V Clean Hydrogen Production Tax Credit makes low-carbon hydrogen production more competitive with unabated fossil fuel production pathways.

Buildings

Buildings-related CO_2 emissions from fossil-fuel combustion are projected to decline from 2005 levels by 3 to 32 percent in 2030, 5 to 36 percent in 2035, and 3 to 39 percent in 2040. Including indirect emissions from electricity, total emissions are projected to decline 55 to 60 percent in 2030, 62 to 73 percent in 2035, and 63 to 75 percent in 2040. Building sector emissions decline despite growth in the residential housing stock and commercial floorspace. New appliance standards and energy efficiency incentives including the IRA 25C Energy Efficient Home Improvement tax credit and the IRA Home Energy Rebates Program promote the increased adoption of higher efficiency appliances, including a significant increase in electric heat pump sales. As a result of energy efficiency improvements and electrification, residential energy use is projected to decline slightly or stay steady by 2040, depending on the model, despite increasing housing stock. Commercial energy use is projected to generally stay steady or increase by 2040, depending on the model. By 2040, electricity is projected to be the primary energy input for the buildings sector, with electricity accounting for 44 to 61 percent of residential use and 50 to 62 percent for commercial use. All of these factors, along with the decarbonization of electricity generation, are projected to drive significant reductions in total energy-related CO_2 emissions in U.S. buildings by 2040.

Fossil Fuel Production

Crude oil and natural gas production are projected to increase through 2040. However, domestic consumption of these fuels is projected to decrease over this period due to increased electrification and efficiency in end-use sectors. Exports are therefore projected to increase. In the power sector, coal, and natural gas consumption are projected to decrease. CH_4 emissions from petroleum and natural gas systems are projected to decrease significantly as a result of recently finalized emissions control regulations, particularly EPA's final New Source Performance Standards for oil and natural gas operations, and continued adoption of voluntary mitigation activities.

Transportation

Transportation-related CO_2 emissions from fossil-fuel combustion are projected to decline 7 to 29 percent in 2030, 13 to 44 percent in 2035, and 16 to 54 percent in 2040, relative to 2005 levels. Including indirect emissions from electricity, total transportation CO_2 emissions are projected to decline 5 to 25 percent in 2030, 11 to 40 percent in 2035, and 13 to 49 percent in 2040. Transportation energy use is projected to peak by 2025 at the latest. All transportation modes are projected to increase in energy efficiency. Vehicle miles traveled across all transportation modes other than domestic shipping are projected to increase through 2040, driven by increased economic activity. The net effect on projections is that energy use decreases by 2040, with the largest decline among light duty vehicles, partially offset by a small increase in air transport energy use.

The percentage of LDV sales that are zero-emission vehicles, including battery-electric, fuel cell-electric, and plug-in hybrid vehicles, grows significantly by 2040 to between 65 and 86 percent, with the range depending on what vehicle technologies auto manufacturers choose to produce under EPA's performance-based emission standards. The net effect of these projections and the decarbonization of the electric grid drives a significant decrease in energy-related transportation CO_2 emissions by 2040.[7]

Several regulations and incentives through the IRA and BIL support EV adoption. The IRA 30D Clean Vehicle Credit, the IRA 25E Pre-Owned Clean Vehicle Credit, and the IRA 45W Credit for Qualified Commercial Clean Vehicles lower the cost of an EV for buyers. Several IRA programs also spur direct investment in clean vehicles, including $3 billion for the U.S. Postal Service to purchase electric delivery vehicles, and $1 billion for a new EPA clean heavy-duty vehicle program. BIL provides $5.5 billion for the Federal Transit Authority's Low or No Emission (Low-No) grant program, which provides funding to states and local authorities to purchase zero- or low-emission transit buses and supporting infrastructure. BIL provides $5 billion for the National Electric Vehicle Infrastructure program and $2.5 billion for the Charging and Fueling Infrastructure Grant Program.

The IRA also supports clean vehicle manufacturing in the United States. The Advanced Technology Vehicles Manufacturing Loan Program received $3 billion in credit subsidy and removed the cap on the previous loan authority, and the Domestic Automotive Manufacturing Conversion Grant Program received $2 billion from the IRA. Both programs support low- or zero-emission vehicles manufacturers. In 2024, EPA published greenhouse gas standards for light- medium- and heavy-duty vehicles. In the same year, the NHTSA finalized new Corporate Average Fuel Economy Standards for light- and medium-duty vehicles. State-level policies, such as Advanced Clean Cars II and Advanced Clean Trucks, focused on zero emissions vehicles sales.

The BIL includes historic investments in low carbon modes such as public transportation, walking/biking infrastructure, intercity rail, and intermodal freight. In addition, an increasing number of state and local governments are enhancing land-use planning to allow for more compact, mixed-use development to make it practical for people to take fewer or shorter trips. Though not explicitly modeled in the scenarios, these actions are anticipated to reduce emissions by providing more convenient and efficient options for travel.

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[7] Note that in 2005, indirect CO_2 emissions from electricity accounted for only 0.2% of transportation CO_2 emissions.

Industrial Processes and Product Use

Emissions from industrial processes and product use (IPPU) are projected to decline by 22 percent in 2030, 25 percent in 2035, and 24 percent in 2040, relative to 2005 levels, despite increased use of natural gas and expanded output.[8] The industrial sector is projected to become the largest consumer of natural gas starting in the 2020s, increasing its use as a feedstock in chemical industries as well as for industrial heat and power. Gross industrial output is projected to grow significantly through 2035; in particular, shipments in bulk chemicals and cement are projected to increase over 25 percent during this period. Electronics (e.g., semiconductor) manufacturing is expected to grow substantially over the next decade as semiconductor production incentives are implemented under the CHIPS Act. This growth has the potential to drive increases in emissions of perfluorocarbons, nitrogen trifluoride, hydrofluorocarbons, and other potent GHGs.

Major IPPU source categories continue to include metals, cement, chemicals production, and use of HFCs in refrigeration and air conditioning. The United States is implementing an 85 percent phasedown of HFC production and consumption by 2036 under the AIM Act, amid several trends that impact projections of HFC emissions from use as ODS-substitutes. Growth in emissions beyond those due to population increases include (1) the increasing emissions from the growth in sales of residential air conditioning with a high-GWP HFC blend, including record-level air conditioning sales and upgrading during the pandemic; and (2) increased economic activity in several subsectors coming out of the pandemic. These are countered by emission reductions from regulations and industry action, including: (1) replacement of high-GWP HFCs with low/zero-GWP substances in light duty vehicle air conditioning, due to compliance flexibilities in the light duty CO_2 emissions rules; (2) transitions in certain parts of the refrigeration, air conditioning, foams, and aerosols markets associated with the ongoing implementation of regulations under the AIM Act and its HFC allocation program to phase down HFC production and consumption; and (3) emission reductions from leak repair and recovery including enhancements in these activities due to potential price increases resulting from the HFC phasedown.

Agriculture

Agriculture-related emissions are projected to increase by 2 percent in 2030 and remain constant through 2035 and 2040, relative to 2005 levels. Across commodities, crop production

[8] This includes indirect emissions from electricity.

in the United States through 2040 is projected to increase modestly due to higher demands for food, livestock feed, and fiber products. These higher demands are primarily driven by increasing U.S. and global populations and income levels. With respect to area, however, land in crop production, both in aggregate and for individual commodities, is projected to remain relatively stable through 2040 relative to 2022. The combination of increasing production and stable cropland area results from a projected continuation of trends in productivity (i.e., increasing yields per acre) that have been observed for the major crops over the last 10–20 years. For example, yields of corn and wheat have been increasing at annual rates around 2.0 and 0.4 bushels per acre per year, respectively, for over a decade.

The projected increases in yields per acre are adequate to meet the projected increases in commodity production without increasing the quantity of land in crop production.

As with the major crops, production of beef, pork, chicken, and dairy products are projected to increase modestly due to rising U.S. and global populations and income levels. Unlike crops, projected increases in productivity (i.e., milk or meat per animal) are not sufficient to meet the growing demands for livestock products resulting in modest increases in projected herd and flock sizes.

With respect to greenhouse gas emissions from agricultural sources, the impacts of expanded conservation practices facilitated by initiatives such as the Partnerships for Climate-Smart Commodities, increased IRA funding for USDA's Natural Resources Conservation Service, and projected increases in the adoption of technologies such as enhanced efficiency fertilizers and anaerobic digesters, result in projected declines in cropland N_2O emissions and projected CH_4 and N_2O emissions manure management between 2023 and 2040. Enteric CH_4 emissions are projected to increase about 8 percent above 2022 levels. Agricultural soils (collectively the sum of cropland remaining cropland, land converted to cropland, grasslands remaining grasslands, and lands converted to grasslands) are also associated with CO_2 emissions and removals. Currently, these soils are a net source of emissions (43 MMT CO_2 eq. in 2022; EPA 2024). The magnitude of this source is projected to decrease significantly through 2026, briefly becoming a net sink in the years 2026-2027, due to the impacts of the conservation programs and projects described above. As those existing projects and funds sunset, the size of the source is projected to stabilize at around 25 MMT CO_2 eq. per year in 2029 through 2040.

There is research ongoing in anaerobic digestion, other manure to energy technologies, livestock feed management and feed additives that reduce enteric CH_4 production, as well as soil health improvements on cropland that could result in further emissions reductions or increased carbon sequestration during that time frame. The potential impacts of climate change on crop yields, livestock productivity, and soil carbon pools were not integrated into this analysis.

Forest and Land Use

As described in the NID, LULUCF activities in 2022 resulted in net CO_2 removals of nearly of 912.8 MMT CO_2 eq./year. Total net carbon sequestration in the LULUCF sector decreased by approximately 11 percent between 1990 and 2022.

U.S. forest land attributes and area are continually changing as the demand for forest products change, as forest management techniques advance, as forests age, and as land use choices shift, including forestland conversion to other uses such as development.

Additionally, climate change is altering forest composition, structure, and dynamics via changes in forest growth, and higher frequency and greater intensity of natural disturbances such as droughts, wildfires and insect and disease outbreaks which can be further compounded via invasive species. Projecting potential future emissions fluxes from LULUCF is challenging due to the uncertainties associated with estimating the complex carbon dynamics of different terrestrial ecosystems and related market interactions, and the potential extent of land use change among sectors.[415]

To reflect these uncertainties, the U.S. LULUCF projections through 2040 in this document are presented as a range. This range incorporates results from three different modeling approaches that use alternate modeling techniques and different perspectives on current policies, future macroeconomic outlooks, land use and climate changes, and accounting of forest dynamics. Using a range from alternative models helps bolster the integrity of the projected results. The approaches used to develop this range are discussed further in Appendix TK, with a brief description of the results here.

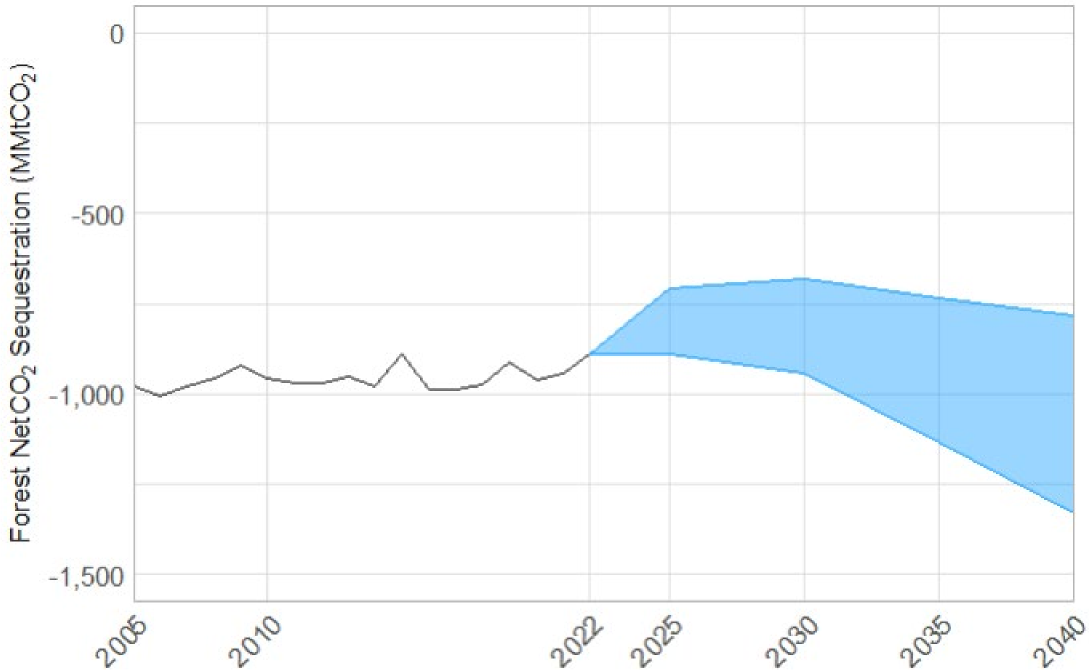
The high end of the sequestration range reflects a maintained and then strengthened net forest sink (meaning carbon stock fluxes increase at a flat or increasing rate) due to a variety of factors including recent market, policy, and environmental drivers. This projection indicates strong continued investment in productive private forest lands by landowners, as well as continued net increases in forest land area. Rising investment in silvicultural practices and forest expansion is driven largely by global demand growth for forest products (rising forest market prices in this estimate engender new forest investments that stimulate increased carbon stocks).

Another driver of these results is the evolving forest and climate policy landscape, which includes recent U.S. policies focused on lands-based mitigation as well as continued private investments in voluntary carbon markets and natural climate solutions. Policy changes – both domestic and international – also affect future potential forest CO_2 fluxes, as policy changes influence landowner behavior (both private and public) and market outcomes, which is reflected in the data. Some lands, especially in the Eastern United States, see moderating harvests and management intensity as landowners increasingly value other outputs besides timber. Increased mitigation in the near term reflects changes in forest management, such as the effects of extending rotations in particular in managed pines and upland hardwoods in the south. There is also decreased harvest from less accessible regions over time and increased harvests from more accessible regions. These factors are augmented by continued atmospheric enrichment through CO_2 fertilization.

The lower sequestration range reflects the U.S. forest sector becoming a smaller net sink of GHG emissions (as carbon stocks increase at a decreasing rate) under current policies and management approaches. This projection estimates increases in forest harvest for products, a net decrease in forest area, an aging forest resource influenced by increasing disturbance rates, and increased forest management (including fuel and other silvicultural treatments) to reduce disturbance risk and increase resilience in the context of climate change adaptation. This trajectory is largely driven by the interaction of increasing harvest with moderate increases in timber prices, the effects of future disturbance on an aging forest, and the increased management which removes carbon over the near term from the forest to increase health and resiliency over the long term (i.e., forest carbon resiliency). The increasing price trends suggest associated investments in forest management and planting. However, in key forest production regions (e.g., the Southeast) this increased investment serves to stem recent decreases in forest plantation area toward a stable plantation area in the future. In the United States, forest plantations account for 9 percent of the forest land base.[416] The remaining 91 percent of the forest land base is typically less intensively managed for timber either providing other ecosystem services (e.g., water, wildlife, aesthetics, recreation) or managed for multiple uses (see for example Butler et al. 2021). Decreased sequestration is anticipated over time in this larger portion of the forest land base as naturally regenerated forest lands are harvested to meet demand with net forest growth potentially slowing due to aging and increased disturbance.

Per this analysis, net GHG emissions flux from LULUCF is projected to change by -24 to +4 percent in 2030, -18 to +26 percent in 2035, and -13 to +48 percent in 2040, relative to 2005 levels. In the interest of transparency, this range of LULUCF uncertainty is presented as it reflects many considerations about various possible future socioeconomic and environmental conditions, and land sector response. Ultimately, the range reflects the broad set of activities currently being taken by the United States to maintain a forest carbon sink that is resilient to future climate change and changes in socioeconomic factors while acknowledging the array of ecosystem co-benefits. As seen in Figure 3-37, net CO_2 sequestration from forest land uses ranges between 782-1328 MMT CO_2 in 2040.

Figure 3-37: Net CO_2 sequestration from forest land uses, 2005-2040



Notes: Net carbon dioxide sequestration fluxes from forestry land uses, 2005-2040. The fluxes reflected here include CO_2 only from Forestland Remaining Forestland and Land Converted to Forest across a range of three tools.

Waste

Emissions from the waste sector are projected to decrease by 16 percent in 2030, 18 percent in 2035, and 20 percent in 2040, relative to 2005 levels. In municipal waste, there is a trend toward larger new landfills, which would be subject to Clean Air Act New Source Performance Standards that require the installation of gas collection systems. Organics and food waste diversion programs are also increasingly diverting waste from landfills, resulting in lower CH_4 generation. There is also a trend toward reliance on remote sensing data to identify and target remediation of large emissions from the waste sector. The trends toward increasing collection of CH_4 from municipal waste and wastewater are partially offset by population growth.

Changes in Gross Emission Projections Between 2022 National Communications and Biennial Report and 2024 Biennial Transparency Report

In the 2022 BR, U.S. net GHG emissions were projected to decline 18-22 percent[9] in 2030 relative to 2005 levels. The 2024 Policy Baseline therefore represents an 11 to 24 percentage point (pp) decrease in emissions compared to the 2022 BR. The 2022 BR projected that total gross emissions would decline by 19 percent[417] by 2030 relative to 2005 levels. The 2024 Policy Baseline projects a 28-40 percent decline, a 9-21 pp decrease in total gross emissions compared to the 2022 BR (see Table 3-4 and Figure 3-38). Due to inflation and other macroeconomic conditions, GDP growth estimates are lower than in the 2022 BR, and population estimates are slightly lower as well. In the 2024 Policy Baseline, this leads to a slightly lower GDP per capita. While energy intensity of GDP remains about the same, emissions intensity of energy declines significantly relative to estimates in the 2022 BR. This reflects the effects of policies that incentivize low- and zero-emission energy production, particularly in electricity generation.

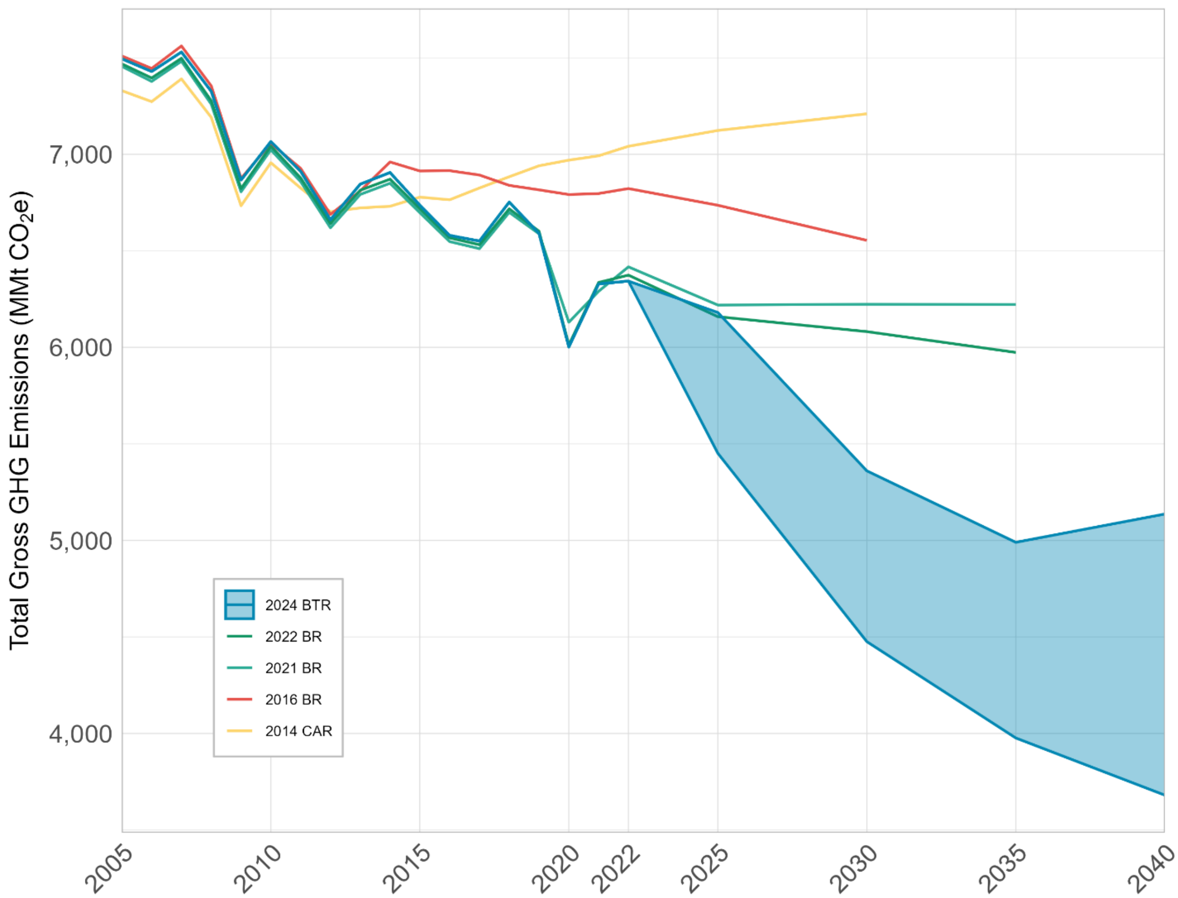
Table 3-4: Comparison of Total Gross Greenhouse Gas Emissions in the 2024 Policy Baseline (2024 BTR) to Previous U.S. Climate Action Reports and Biennial Reports (MMT CO_2 eq.)

Publication	2005	2010	2015	2020	2025	2030	2035	2040
2024 BTR	7,495	7,066	6,736	6,002	5,451 - 6,181	4,475 - 5,360	3,976 - 4,990	3,680 - 5,136
2022 BR	7,469	7,042	6,718	6,012	6,159	6,082	5,974	—
2021 BR	7,456	7,023	6,698	6,130	6,219	6,223	6,222	—
2016 BR	7,510	7,057	6,914	6,792	6,736	6,554	—	—
2014 CAR	7,330	6,956	6,778	6,970	7,124	7,210	—	—

Notes: Historical and projected years vary between reports. Previous National Communication projections have been adjusted for comparability and may vary from tables published in those reports. Where Fifth Assessment Report (AR5) GWP values were not used, CO_2-equivalent projections have been adjusted to reflect AR5 GWPs.

[9] Emissions reduction range differs from reported range in the 2022 BR. The range presented in this report updated GWP values for non-CO_2 gasses to AR5, while the 2022 BR uses AR4.

Figure 3-38: Gross Greenhouse Gas Emissions Projections by Report



Notes: Historical and projected years vary between reports. Previous National Communication projections have been adjusted for comparability and may vary from tables published in those reports. Where Fifth Assessment Report (AR5) GWP values were not used, CO_2-equivalent projections have been adjusted to reflect AR5 GWPs.

Additional Greenhouse Gas Mitigation Opportunities

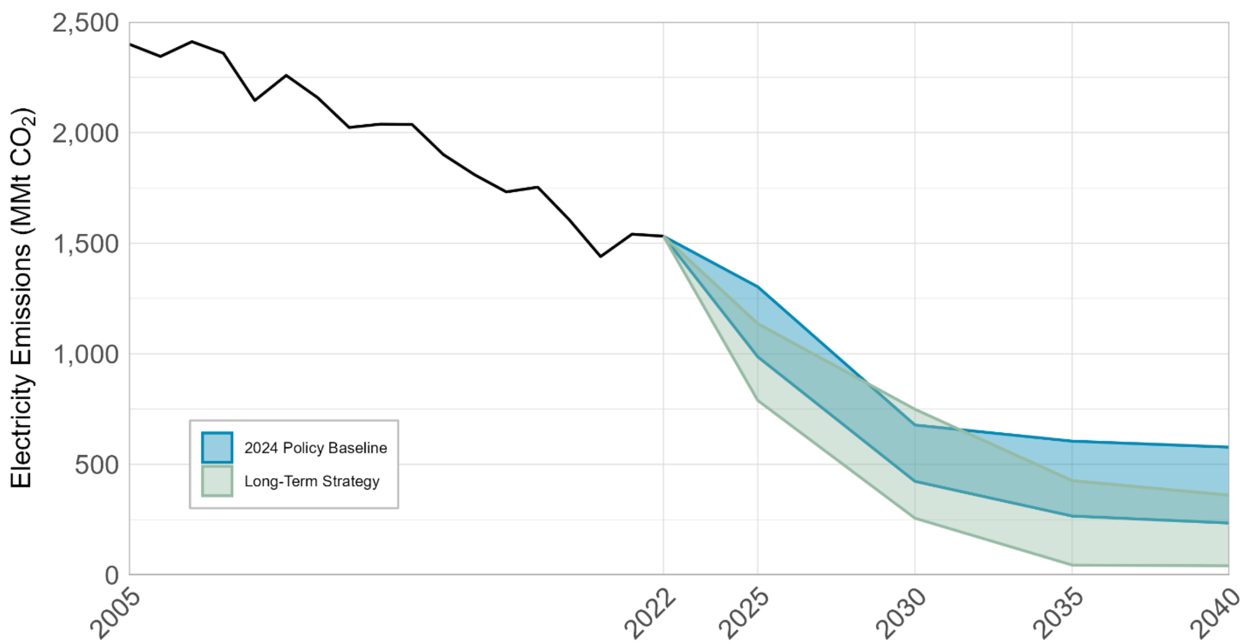
The U.S. NDC set a target to reduce GHG emissions by 50 to 52 percent in 2030 relative to 2005 levels. To achieve these goals, additional policies and measures at all levels of government, and throughout society, will be needed. The 2024 Policy Baseline reflects major federal policies, such as the IRA, BIL, major vehicle, power plant, and oil and natural gas regulations, and appliance standards. However, there are additional measures included in the full list of Policies and Measures (see earlier in Chapter 3) that are not reflected in 2024 Policy Baseline scenarios due to modeling limitations. These policies include loan programs and various direct funding programs. In addition, most state- and local-level measures are not explicitly reflected in these scenarios, with the exception of clean electricity standards, renewable portfolio standards, and clean vehicle standards.

As noted in the section summary above, this report does not include a "With Additional Measures" scenario. However, this section outlines the additional measures that the Federal Government is undertaking to make progress toward meeting and surpassing its NDC. The section also compares the energy-related CO_2 emissions from the 2024 Policy Baseline with net-zero by 2050 GHG emission pathways from the 2021 Long-Term Strategy of the United States to illustrate consistencies with or deviations from net-zero by 2050 GHG emissions pathways for electricity, buildings, transportation, and industry.

As shown below, the U.S. power sector is projected to dramatically lower energy-related CO_2 emissions by 2040, which enables decarbonization in other sectors that rely heavily on electricity to meet energy demand. However, U.S. goals are more ambitious. In 2021, the U.S. announced a goal to achieve 100 percent clean electricity by 2035. The U.S. Department of Energy has identified key actions that can accelerate progress toward this goal.[418] These include maintaining the existing clean generation and storage fleet, increasing options for clean generation, storage, and carbon management technologies, and dramatically accelerating electric energy efficiency and demand flexibility. A part of this strategy includes investment and engagement with disadvantaged communities to ensure that the benefits of 100 percent clean power are distributed equitably and that the clean energy workforce is expanded equitably. There is significant uncertainty about the role that nascent generation technologies can play in greater decarbonization of the power sector. Three technologies that could play a role include nuclear (e.g., small modular reactors or new conventional reactors), advanced geothermal, and offshore wind. Numerous projects employing these technologies are currently in advanced stages of development and could potentially be online and generating electricity for sale to the grid by the late 2020s or early 2030s. Additionally, long duration storage and other grid technologies that could allow for more penetration of renewables are in similar stages of development.

Successful development and marketization of any of these technologies could lead to significant GHG emission reductions in the power sector. Additional technologies, including natural gas with CCS, will be important components of a comprehensive strategy to further reduce GHG emissions in the power sector. Compared to Long-Term Strategy pathways, the lower range of the 2024 Policy Baseline falls slightly below the upper range of the Long-Term Strategy (Figure 3-39).

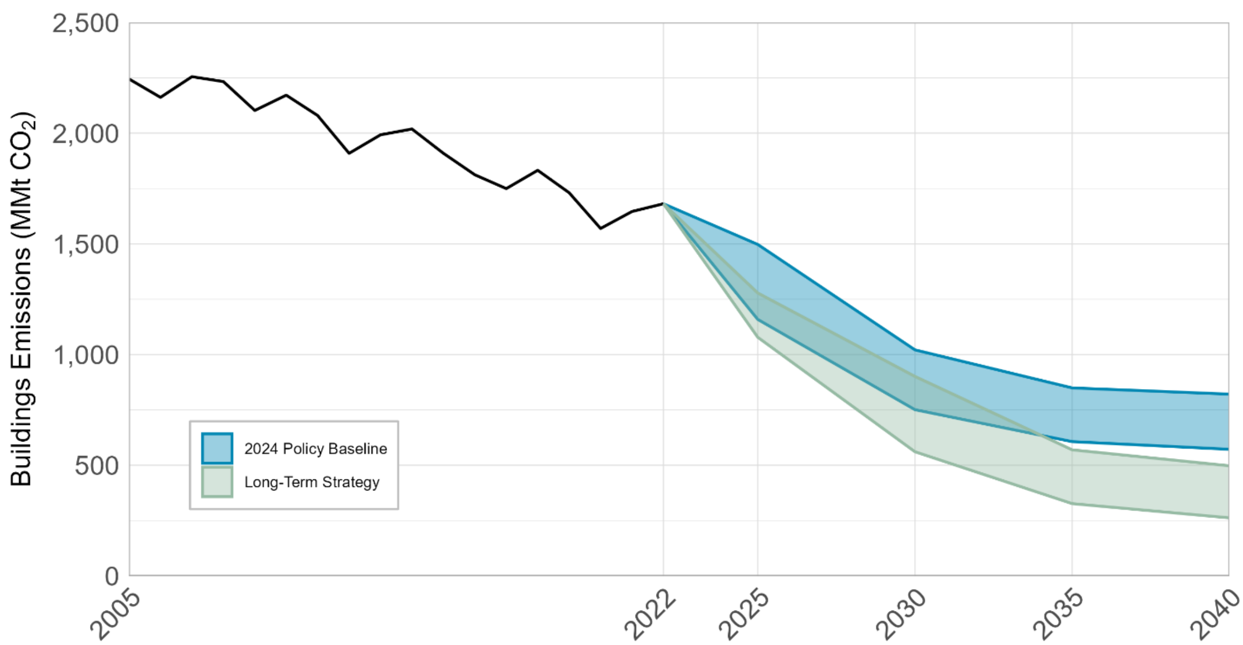
Figure 3-39: Energy-Related CO_2 Emissions in the Electricity Sector, 2024 Policy Baseline vs.2021 Long-Term Strategy



Notes: Data prior to 2022 are from the NID. The range shown for the 2024 Policy baseline comes from the three different models used to project energy CO_2. The Long-Term Strategy data range is from the 2021 report "The Long-Term Strategy of the United States.

Buildings are on track to achieve a 3 to 39 percent reduction in total energy-related CO_2 emissions in 2040. While reductions through 2030 reach the Long-Term Strategy range, the gap between the two projections expands thereafter. To accelerate reductions and close the post-2030 gap, the United States will continue to focus on increasing energy efficiency and switching to cleaner and more efficient energy carriers and technologies. In 2024, the Federal Government published a decarbonization blueprint outlining how the United States can reduce total building emissions, including indirect emissions, 65 percent by 2035 and 90 percent by 2050, relative to 2005.[419] Achieving these targets hinges on four key factors: 1) reducing energy use intensity by 35 percent in 2035 and 50 percent in 2050; 2) reducing on-site GHG emissions by 25 percent in 2035 and 75 percent in 2050; 3) reducing electricity infrastructure costs by tripling demand flexibility potential by 2050; and 4) reducing embodied emissions in building materials and construction by 90 percent in 2050. Future actions that can support these goals include building performance standards (already in place in several states including Washington, Maryland, and Colorado), continued implementation of the AIM Act of 2020, streamlining standards to accelerate adoption of heat pumps, water heaters, and smart control systems, expanding demand response programs that have been used by utilities for decades, and continued implementation of Federal procurement policies that target building materials with low embodied carbon. Such actions aim to help close the gap between buildings emissions in the 2024 Policy Baseline and the Long-Term Strategy (Figure 3-40).

Figure 3-40: Energy-Related CO_2 Emissions in the Buildings Sector, 2024 Policy Baseline vs. 2021 Long-Term Strategy



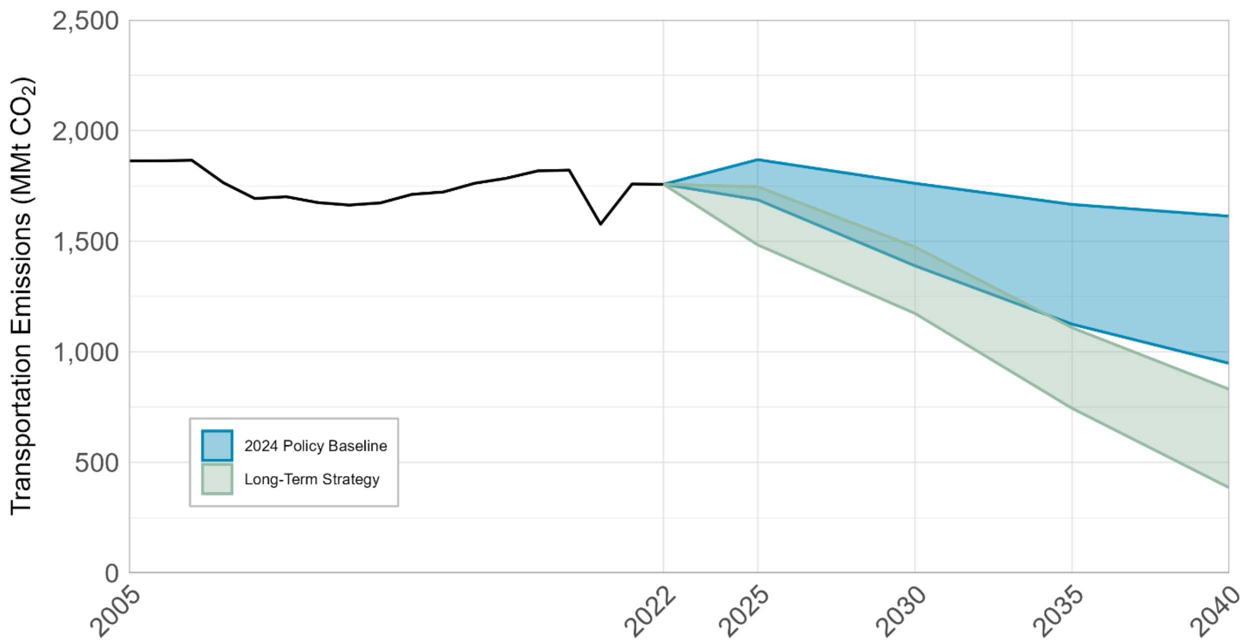
Notes: Data prior to 2022 are from the NID. The range shown for the 2024 Policy baseline comes from the three different models used to project energy CO_2. The Long-Term Strategy data range is from the 2021 report "The Long-Term Strategy of the United States". Emissions are inclusive of direct emissions from fossil-fuel combustion and indirect emissions from electricity.

The U.S. transportation sector is projected to achieve 16%-54% reduction in total energy-related CO_2 emissions in 2040, relative to 2005 levels under the 2024 Policy Baseline. The U.S. has targets of 50% light-duty zero-emission vehicle sales by 2030[10] and 100% medium- and heavy-duty electric vehicle sales by 2040.[11] Modeling suggests that these targets are in reach, with light-duty electric vehicle sales reaching 39%-72% in 2030. Policy mechanisms that can enable further progress include stronger market incentives (e.g., increased and expanded incentives for zero-emission vehicles and sustainable fuels), financial incentives (e.g., prioritizing clean transportation technologies in grant programs and support for public transportation), and infrastructure compatibility standards. In addition, increasing investments in low carbon

[10] https://www.whitehouse.gov/cleanenergy/ev-acceleration-challenge/
[11] https://globaldrivetozero.org/mou-nations/

modes such as public transportation, walking/biking infrastructure, intercity rail, and intermodal freight can drive down emissions by enabling mode shift. An increasing number of state and local governments are enhancing land-use planning to allow for more compact, mixed-use development to make it convenient for people to take fewer or shorter trips. The U.S. federal government published the U.S. National Blueprint for Transportation Decarbonization in 2023 and is implementing its three-part framework to improve convenience, increase efficiency, and transition to clean vehicles and fuels.[12] These types of actions may help bring projected transportation emissions more in line with the Long-Term Strategy scenarios (Figure 3-41).

Figure 3-41: Energy-Related CO_2 Emissions in the Transportation Sector, 2024 Policy Baseline vs. 2021 Long-Term Strategy



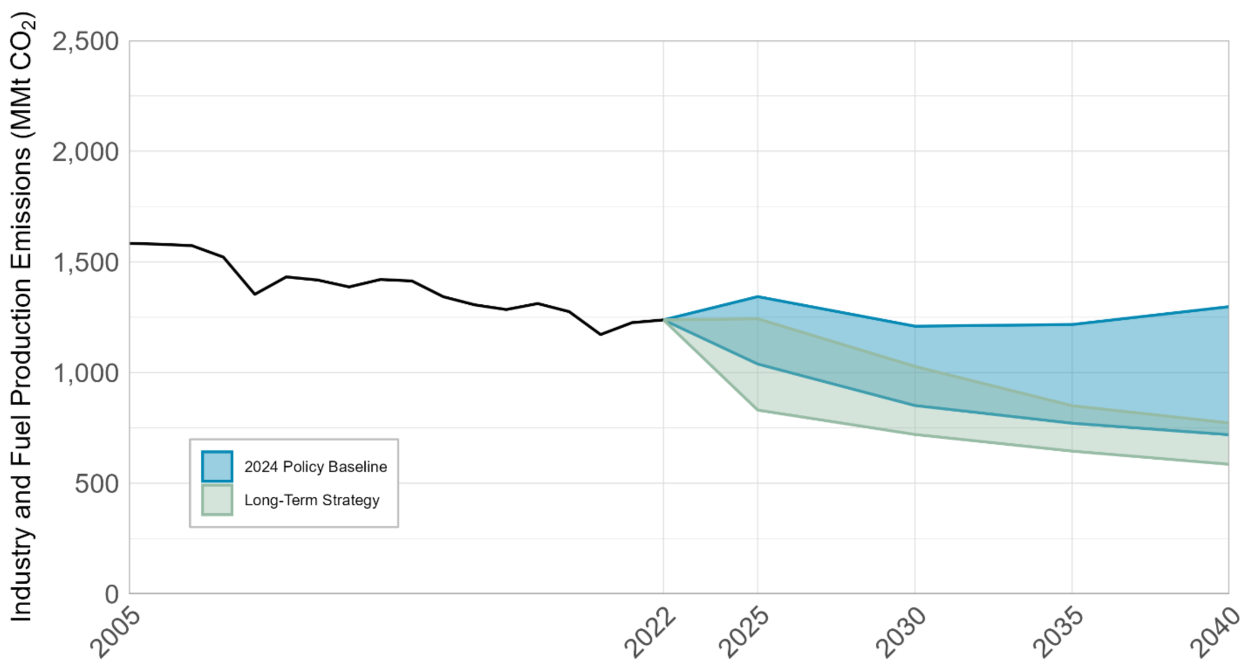
Notes: Data prior to 2022 are from the NID. The range shown for the 2024 Policy baseline comes from the three different models used to project energy CO_2. The Long-Term Strategy data range is from the 2021 report "The Long-Term Strategy of the United States. Emissions are inclusive of direct emissions from fossil-fuel combustion and indirect emissions from electricity.

In the 2024 Policy Baseline, the industrial and fuel production sector achieves an 18 to 55 percent reduction in total energy-related CO_2 emissions in 2040, relative to 2005 levels. In 2022, DOE published an industrial decarbonization roadmap identifying four strategies for decarbonizing U.S. industry: 1) energy efficiency, 2) industrial electrification, 3) low carbon fuels, feedstocks, and energy sources, 4) CCUS. To address these four pillars, the United States has invested in advancing research development and demonstration for carbon capture and

[12] U.S. National Blueprint for Transportation Decarbonization

utilization, hydrogen production with carbon management, and industrial decarbonization technologies. The United States has also invested in demonstration projects that will accelerate and de-risk deployment in carbon capture, hydrogen production, and industrial production processes. Additional policies can further advance research and demonstration of key technologies, provide demand signals for low-carbon materials and products through continued implementation of federal procurement initiatives (e.g., Federal Buy-Clean), and continue and expand upon supply-side incentives that support increased efficiency, electrification, CCUS, and low carbon fuels and feedstocks. Successful demonstration and deployment of industrial decarbonization pathways may bring projected industrial emissions within the range of the Long-Term Strategy scenarios (Figure 3-42).

Figure 3-42: Energy-Related CO_2 Emissions in the Industrial Sector, 2024 Policy Baseline vs. 2021 Long-Term Strategy



Notes: Data prior to 2022 are from the NID. The range shown for the 2024 Policy baseline comes from the three different models used to project energy CO_2. The Long-Term Strategy data range is from the 2021 report "The Long-Term Strategy of the United States. Emissions are inclusive of direct emissions from fossil-fuel combustion and indirect emissions from electricity for both the industrial and fuel production sectors.

With respect to non-CO_2 GHGs, the United States is in the process of implementing a comprehensive set of policies to reduce CH_4 emissions from the oil and natural gas sector. Some of these policies have been implemented as of 2024, such as recently finalized emissions control regulations. The IRA provided additional authority for new programs, such as the Methane Emissions Reduction Program, which provides financial and technical assistance and establishes a Waste Emissions Charge on emissions that exceed certain thresholds. These IRA provisions are in the process of implementation, and therefore are not reflected in the 2024 Policy Baseline scenario. The United States also operates voluntary EPA-industry programs to reduce emissions of HFCs from disposal of refrigerated appliances and emissions of SF_6 from electrical transmission and distribution systems.

The U.S. forest sector, inclusive of ecosystem and harvested wood products, is projected to serve as a net sink of between 794 to 1,339 MMT CO_2 Eq. per year in 2040 under current policies, where sufficient information exists to model those policies. One component of the IRA not considered is a dedicated focus on enhancing forest-based products analysis and production, including wood products as a substitute for greenhouse gas intensive products, especially in the context of ecosystem restoration co-benefits where forest health is poor. As such wood product innovation is forthcoming, the types of potential wood products and their associated GHG and other outcomes is too uncertain for inclusion at this time but warrant future consideration given implications of potential contributions from the forest sector in the face of climate change. In addition, afforestation is a key natural climate solution across working landscapes which could be expanded through potential future shifts in current programs such as the Conservation Reserve Program and also new programs focused on potential uses of marginal lands.

Relatedly, USDA is engaging in many additional efforts to unlock the mitigation potential that exists within the agriculture and forestry sector. These efforts include facilitating producer participation in carbon markets through the Growing Climate Solutions Act, engaging in initiatives to expand the commercial potential of innovative mitigation technologies like biochar, taking actions to reduce food loss and waste, and building the data, modeling and verification systems that are needed to support incentives for the adoption of climate-smart practices into tax credits that support renewable fuels. Through the SUSTAINS Act, USDA is also exploring options for partnering with the private sector to increase the resources available to farmers, ranchers, and forest landowners for the adoption of conservation measures such as climate-smart production practices.

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Chapter 4:

Information Related to Climate Change Impacts and Adaptation

under Article 7 of the Paris Agreement

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Introduction

Human activities have dramatically altered the world's climate, ocean, land, ice cover, and ecosystems, resulting in impacts on human health, agriculture, infrastructure, natural resources, and other sectors of the economy. Across the United States, climate change is accelerating the frequency and fueling the severity of extreme weather events, both acute and chronic, resulting in tragedies and new realities that once seemed unimaginable. From record-shattering heat waves across the Midwest and Northeast, extended drought in the West, devastating flooding in Iowa and Minnesota, raging wildfires in New Mexico, Oregon, and California, to hurricanes in the Southeast, communities in every corner of the country are being directly impacted by the effects of climate change.[1,2,3,4,5] In addition to posing direct threats to lives and livelihoods, weather and climate events – which are becoming increasingly extreme due to the warming climate – have had significant economic impacts. Last year's record 28 individual billion-dollar extreme weather and climate disasters caused more than $90 billion in aggregate damage.[6]

In the face of these perils, Americans are not standing idle; they are rising to confront the risks and challenges of climate change in extraordinary and inspiring ways. Communities are restoring natural infrastructure, such as marshes and wetlands, to defend against flooding; installing solar panels and battery storage to limit the strain on the grid and function as back-up power; and adopting climate-informed forest management practices, including those based on Indigenous Knowledge, to reduce the risk of catastrophic wildfires. The United States has scaled up actions that enhance the resilience of communities, infrastructure, and natural resources to the impacts of climate change domestically. The United States also supports partners around the world in building resilience to climate change – further information on these programs can be found in Chapter 5.

The global goal on adaptation, established by the Paris Agreement, contains three elements: enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. In 2023, Parties adopted in decision 2/CMA.5, the United Arab Emirates (UAE) Framework for Global Climate Resilience (the "UAE Framework"), which is intended "to guide the achievement of the global goal on adaptation and the review of overall progress in achieving it." Paragraph 9 of decision 2/CMA.5 includes seven thematic targets relating to: (a) water, (b) food/agriculture, (c) health, (d) ecosystems and biodiversity, (e) infrastructure, (f) livelihoods, and (g) cultural heritage. Additionally, paragraph 10 identifies four targets: (a) risk and vulnerability assessment, (b) planning, (c) implementation, and (d) monitoring and evaluation.[7] The adoption of this critical framework has helped specify the actions Parties can take to contribute to building global climate resilience by making progress toward the targets in a manner consistent with their national priorities and circumstances. The United States is taking action to make progress toward these targets through a variety of policies, programs, and workstreams. Actions contributing toward one or more of the targets in the UAE Framework are denoted throughout this chapter with parenthetical references to the relevant target or targets.

This chapter includes the following sections:

A. National circumstances, institutional arrangements, and legal frameworks;
B. Impacts, risks, and vulnerabilities;
C. Adaptation priorities and barriers;
D. Adaptation strategies, policies, plans, goals, and actions to integrate adaptation into national policies and strategies;
E. Progress on implementation of adaptation;
F. Monitoring and evaluation of adaptation actions and processes; and
G. Cooperation, good practices, experience, and lessons learned.

This chapter also serves as the United States' second Adaptation Communication under the Paris Agreement.

A. National Circumstances

Biogeophysical Characteristics

With its biogeophysical diversity, the United States is exposed to many different types of climate impacts, including droughts and wildfires, inland and coastal flooding, extreme heat, loss of permafrost and sea ice, ecosystem and biodiversity loss, and more. Chapter 3, Section A: Climate Profile outlines some of the changes in temperature and precipitation already experienced in the United States, and further details on U.S. biogeophysical characteristics are noted in Chapter 3, Section A: Geographic Profile.

Demographics

U.S. population estimates are noted in Chapter 3, Section A: Population Profile. As of July 2023, 5.5 percent of the population are under the age of 5, 21.7 percent of the population is under the age of 18, and 17.7 percent is 65 years and over. In terms of race, 75.3 percent of the population is White alone, 13.7 percent is black or African American alone, 1.4 percent is American Indian and Alaska Native alone, 6.4 percent is Asian alone, 0.3 percent is Native Hawaiian and Other Pacific Islander alone, and 3.1 percent is two or more races. Regarding Hispanic origin, 19.5 percent is Hispanic or Latino[1], and 58.4 percent is White alone, not Hispanic or Latino.[8]

Vulnerabilities are spread widely, but unevenly, across the United States. Climate change exacerbates long-standing social inequities experienced by underserved and overburdened communities, contributing to persistent disparities in the resources needed to prepare for, respond to, and recover from climate impacts. Low-income communities and communities of color face higher risks of illness and death from extreme heat, climate-driven floods, air pollution, and wildfire smoke compared with White people, and often lack access to climate resilient infrastructure, green spaces, safe housing, and protective resources.[9] Future climate change is expected to further disrupt many areas of life, exacerbating existing challenges posed by aging and deteriorating infrastructure, stressed ecosystems, and economic inequality.

The impacts are especially acute on Indigenous Peoples as interconnected social, physical, and ecological systems are disrupted. Many Tribes rely on, but face institutional barriers to, self-determined management of water, land, other natural resources, and infrastructure that will be increasingly impacted by changes in climate. These institutional barriers include limited access to traditional territory and resources, which severely limits their adaptive capacities.

Economy

Climate change is projected to reduce U.S. economic output and labor productivity across many sectors, with effects differing based on local climate and the industries unique to each region. Climate-driven damages to local economies especially disrupt heritage industries (e.g., fishing traditions, trades passed down over generations, and cultural heritage-based tourism) and communities whose livelihoods depend on agricultural and natural resources. For example, as fish stocks in the Northeast move northward and to deeper waters in response to rapidly rising

[1] Hispanics may be of any race, so also are included in applicable race categories

ocean temperatures, important fisheries like scallops, shrimp, and cod are at risk. In Alaska, climate change has already contributed to fishery disasters due to increased water temperature and extreme weather events.[10]

Climate change poses occupational threats to worker's health and safety, largely through increased heat morbidity and mortality. The Southeast and U.S. Caribbean face high costs from projected labor losses and heat health risks to outdoor workers, and small businesses are already confronting higher costs of goods and services and potential closures as they struggle to recover from the effects of compounding extreme weather events.[11]

There were 28 weather and climate disasters in 2023, surpassing the previous record of 22 in 2020, tallying a price tag of at least $92.9 billion. The South, Central, and Southeast regions of the United States, including the Caribbean U.S. territories, have suffered the highest cumulative damage costs from weather disasters, reflecting the severity and widespread vulnerability of those regions to a variety of weather and climate events.[12]

With every additional increment of global warming, costly damage is expected to accelerate. For example, 2°F (1.1°C) of warming is projected to cause more than twice the economic damage compared to the damages associated with 1°F of warming.[13] Damage from additional warming poses significant risks to the U.S. economy.

Infrastructure

Climate change threatens vital infrastructure that moves people and goods, powers homes and businesses, and delivers public services. Many infrastructure systems across the country are at the end of their intended useful life and were not designed to cope with additional stress from climate change. For example, extreme heat causes railways to buckle, severe storms overload drainage systems, and wildfires result in roadway obstruction and debris flows. Risks to energy, water, healthcare, transportation, telecommunications, and waste management systems will continue to rise with increased climate change, with many infrastructure systems at risk of failing.

In coastal areas, sea level rise threatens permanent inundation of infrastructure, including roadways, railways, ports, tunnels, and bridges; water treatment facilities and power plants; and hospitals, schools, and military bases. More intense storms also disrupt critical services like access to medical care, as seen after Hurricanes Irma and Maria in the U.S. Virgin Islands and Puerto Rico. Hurricanes Helene and Milton significantly damaged power and water services across the Southeast.[14]

At the same time, climate change is expected to place multiple demands on infrastructure and public services. For example, higher average temperatures and more intense heatwaves will heighten electricity and water demand, while wetter storms and intensified hurricanes will strain wastewater and stormwater management systems. In turn, these compounded events can also lead to increased demand on related services like healthcare systems. In the Midwest and other regions, aging energy grids are expected to be strained by disruptions and transmission efficiency losses from climate change.[15]

Adaptive Capacity

The United States has relatively high adaptive capacity to address the multifaceted impacts of climate change, driven by its robust governance systems, technological innovation, and legal and regulatory frameworks. Diverse adaptation activities are occurring across the United States and are increasingly moving from awareness and assessment to planning and implementation, though with limited advancement toward monitoring and evaluation. To date, adaptation across the United States has been incremental in nature, and given the expected future pace of climate change, more action is needed at greater rates and larger scales, across more sectors, and in context-specific ways. Historically, actions to adapt often have not centered equity and were not designed using a systems-oriented, regional, or collaborative approach for transformation.

Adaptation researchers and practitioners are starting to track the number of actions, assess the adaptation effectiveness of those that have occurred, and evaluate the long-term sufficiency of adaptation projects. However, frameworks, monitoring, indicators, and evaluations that assess adaptation practices, co-benefits, equality, and implementation at appropriate levels of granularity are still under development. With the lack of consistent tracking and evaluation of adaptive capacity and how effectively society and ecosystems are adapting to climate change, it is challenging to measure progress in adaptive capacity and its changes over time.

Institutional Arrangements and Governance

Since its 2022 biennial report, the United States has increased the uptake of adaptation actions to address the impacts of climate change, in part supported by the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA), discussed below. Transformative adaptation, which involves more fundamental shifts in systems, values, and practices, will be necessary in many cases to adequately address the risks of current and future climate change.[16] New monitoring and evaluation methods will also be needed to assess the effectiveness and sufficiency of adaptation and to address equity. Additional information on adaptation efforts is provided further below.

National Climate Task Force

Comprised of Cabinet Secretary-level representatives from more than 25 Federal agencies, the National Climate Task Force was established to ensure a coordinated, whole-of-government response to the many different dimensions of the climate crisis. Within the Task Force, there are several subgroups focused on priority climate resilience themes, including wildfire resilience, flooding, extreme heat, drought, coastal resilience, and support of community-driven relocations. While coordinating U.S. government efforts, the Task Force also works to design, empower, and support whole-of-society responses to climate change.

U.S. Global Change Research Program (USGCRP)

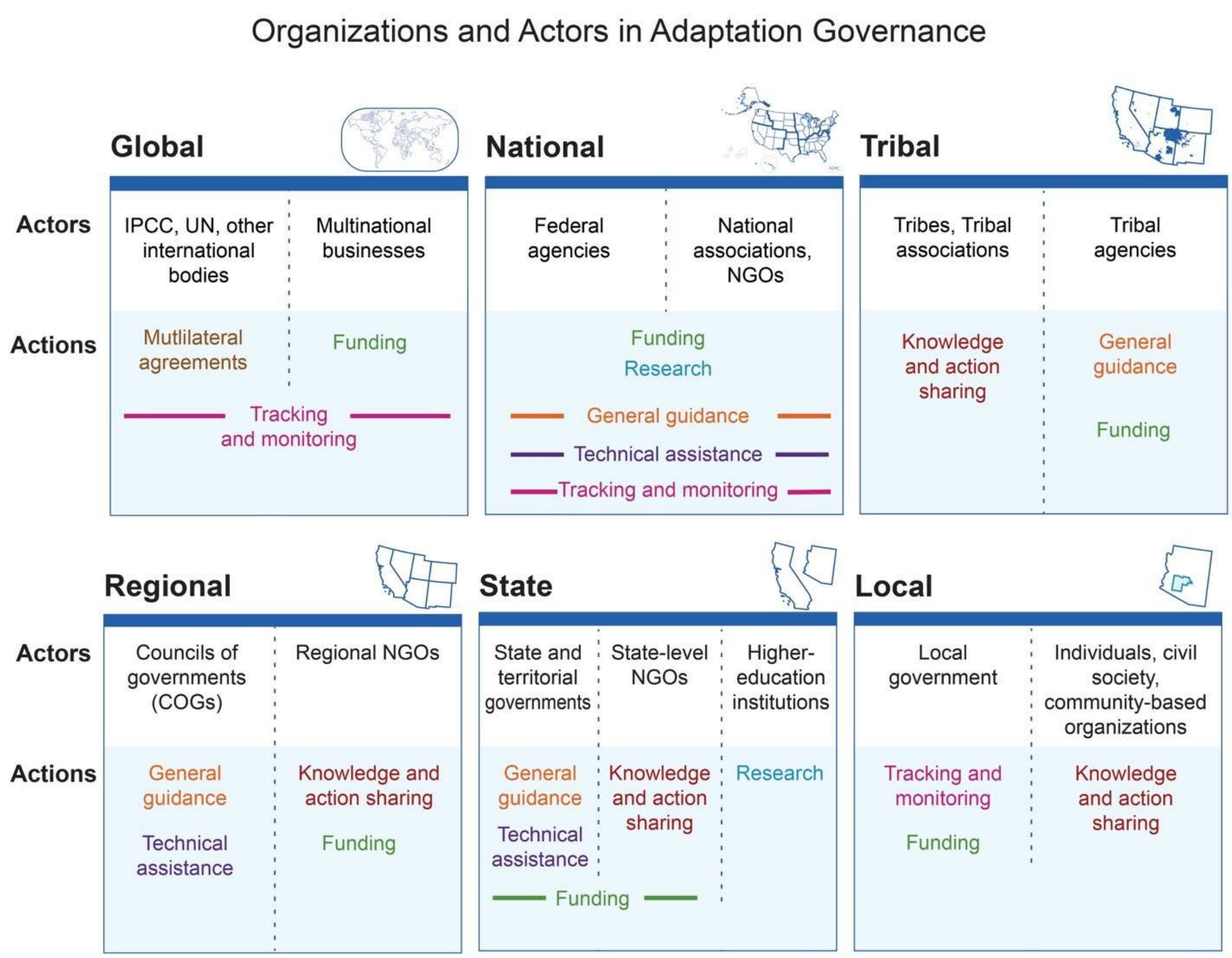
The National Science and Technology Council (NSTC) established an interagency Fast Track Action Committee (FTAC) on Climate Services. In March 2023, the FTAC produced *A Federal Framework and Action Plan for Climate Services* that recommended that the existing USGCRP[17] provide national leadership for coordination and strategic planning of climate services. In response, the National Science and Technology Council established a new subcommittee under USGCRP – the Subcommittee on Climate Services (SCS). SCS is working to improve interagency coordination of Federal climate services, better linking both producers and users of climate data, tools, information, and technical assistance in order to facilitate improved decision-making and disaster preparedness efforts.

USGCRP also coordinates the interagency Federal Adaptation and Resilience Group (FARG), which brings together nearly 200 experts from bureaus and agencies across the Federal Government. The FARG helps to share information and experience, produce publications, and support co-investment and co-development of tools and information resources to help agencies align their climate adaptation strategies and priorities. In 2024, the group held workshops on the array of climate adaptation programs being funded under recent legislation, aligning Federal agencies' online resources for adaptation, and Federal agency approaches to monitoring and evaluating climate adaptation investments.

Institutions Outside the Federal Government

In the United States, many types of organizations make decisions about adaptation, including Federal, state, territorial, Tribal, and local governments; businesses; nonprofits; households; and individuals—all with varying and overlapping jurisdictions. While some adaptation decisions are made unilaterally, most decisions involve multiple organizations. Adaptation networks have become more sophisticated in the last decade, involving a greater number of actors from more diverse organizational backgrounds, as seen in Figure 4-1. The actors involved often have distinct (and at times divergent) views of the problem, risk tolerance levels, priorities, preferred solutions, and ideal futures.

Figure 4-1: Climate adaptation involves numerous actions by different actors at multiple jurisdictional scales



Source: United States Fifth National Climate Assessment[18]

Effective and equitable adaptation governance also benefits from intentional engagement and coordination between all involved actors over a sustained period. For example, following multiple wildfires and postfire floods, the Tribal community of Santa Clara Pueblo collaborated with multiple Federal agencies, the State of New Mexico, and several other Tribes to restore their watershed and to build resilience against future floods. In Oregon, following a deadly 2021 heat dome event, the state's legislature funded its Medicaid program to provide air conditioners and funding for utility costs to vulnerable residents in partnership with community-based organizations, furnishing 4,400 air conditioners in 2022 and 3,000 in 2023.[19] These kinds of collaborations are particularly effective when a single government agency leads coordination of an interorganizational group to oversee adaptation activities. Alternatively, coordinating hubs can help bridge activities of disparate actors; having well-defined roles and responsibilities can avoid duplicated efforts.

Well-functioning, multilevel governance helps in adaptation strategy development. For example, California, Florida, and other states have used informal regional collaborations (e.g., Southeast Florida Regional Climate Compact, Alliance of Regional Collaboratives for Climate Adaptation) to share resources and develop adaptation strategies that serve regional needs. The Coastal Zone Management Act, which requires Federal, state, territorial, Tribal, and local coordination in a single review of newly developed laws beyond borders to protect and develop coasts, is a potential model for encouraging greater cross-scale actions. Vertical linkages between governance levels can help bridge the gap between community-based and national-level adaptation efforts and enhance horizontal linkages across public and private actors and institutions. Horizontal network linkages enable diffusion of information and resources across similar organizations; for example, horizontal connections between community groups facilitate selective adoption of context-specific adaptations and the scaling out of successful adaptation.[20]

Further, there are collaborations amongst government and other stakeholders. For example, the United States Geological Survey National and Regional Climate Adaptation Science Centers (CASCs) is a partnership driven program that teams scientists with natural and cultural resource managers and local communities to help fish, wildlife, water, land, and people adapt to a changing climate.[21]

Another example can be found with the Urban Sustainability Directors Network (USDN), which brings local government sustainability practitioners together to learn, collaborate, and accelerate the work of local sustainability. By providing knowledge, resources, and partnerships, USDN helps advance change locally in member communities as well as across the field of practice.[22]

Legal & Policy Frameworks

The Bipartisan Infrastructure Law and Inflation Reduction Act

These two landmark pieces of legislation together invest more than $50 billion in Federal activities, programs, and grants to communities and state, local, Tribal, and territorial governments to advance climate resilience. Investments are in areas where climate change strongly affects community resilience and sustainability such as wildfire defense, coastal and inland flooding resilience, water infrastructure and drought monitoring systems, protections against extreme heat, and rehabilitating watersheds.

The National Climate Resilience Framework

Recognizing that addressing the projected risks and impacts of climate change would require an all-hands-on-deck effort, coordinated across the Federal Government, with all levels of subnational government, and with a wide range of non-governmental institutions, President Biden directed the creation of a first-ever National Climate Resilience Framework to identify key values, priorities, and objectives to help expand and accelerate nationally-comprehensive, locally-tailored, and community-driven adaptation and resilience strategies.

The National Climate Resilience Framework,[23] published in September 2023, lays out the U.S. Government's vision for advancing climate resilience, designed to guide and align climate resilience investments and activities by the Federal Government and its partners.

The Framework identifies six core objectives – supported by specific actions – that are critical to strengthening U.S. protections against the impacts of climate change; that make communities safe, healthy, equitable, and economically strong; and that can and should be a focus of climate resilience efforts at all levels. The objectives are detailed in Section C: Domestic priorities.

The Fifth National Climate Assessment

The Global Change Research Act of 1990 mandates that USGCRP deliver a report to Congress and the President not less frequently than every four years that "integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings; analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years."[24]

Published in 2023, the *Fifth National Climate Assessment* (NCA5) "fulfills that mandate by delivery of this Assessment and provides the scientific foundation to support informed decision-making across the United States." By design, much of the development of NCA5 built upon the approaches and processes used to create the *Fourth National Climate Assessment* (NCA4), with a goal of continuously advancing an inclusive, diverse, and sustained process for assessing and communicating scientific knowledge on the impacts, risks, and vulnerabilities associated with a changing global climate.[25] NCA5 includes a chapter on Climate Adaptation which includes many economic and societal benefits from adaptation. *(Target 10(a))*

Adaptation-Related Executive Orders and Memoranda

Executive Orders (EO) and Memoranda released by the Office of the President since 2021 have directed Federal agencies to assess and expand adaptation capacity in efforts to build just and sustainable global resilience against the climate crisis. A non-exhaustive selection of EOs and Memoranda are included below.

- <u>Tackling the Climate Crisis at Home and Abroad (January 20, 2021):</u> EO 14008 places the climate crisis at the center of foreign and domestic policy. Domestic adaptation directives include aligning the management of Federal procurement and real property, public lands and water, and financial programs to support robust climate action (Section 204) and empowering workers to build sustainable infrastructure and a clean energy economy (Sections 212 and 213). EO 14008 also establishes the President's ambitious environmental justice agenda, including Presidential initiatives like the Justice40 Initiative, the Environmental Justice Scorecard, and the Climate and Justice Economic Screening Tool.[26] *(Target 10(b))*
- <u>Rebuilding and Enhancing Programs to Resettle Refugees and Planning for the Impact of Climate Change on Migration (February 4, 2021):</u> EO 14013 orders U.S. policy, reporting, and visa practices, in association with United States Refugee Admission Program (USRAP), to adapt to meet the humanitarian needs required by the impacts of climate change.[27] *(Target 9(e))*
- <u>Climate-Related Financial Risk (May 20, 2021):</u> EO 14030 adopts a government-wide financial strategy to mitigate climate risks and its drivers, while accounting for and addressing disparate impacts on disadvantaged communities and communities of color. Financial adaptation measures include Section 3: "Assessment of Climate-Related

Finance Risk," Section 4: "Resilience of Life Savings and Pensions," and Section 6: "Long-Term Budget Outlook."[28] *(Targets 9(f) and 10(b))*

- Directing Implementation of the Infrastructure Investment and Jobs Act (November 15, 2021): EO 14052 directs U.S. infrastructure investment nation-wide to advance environmental justice through priority implementation and task force management. This will be accomplished through investing public dollars equitably, including through the Justice40 Initiative.[29] *(Targets 9(e) and 10(b))*
- Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability (December 8, 2021): EO 14057 outlines a coordinated, whole-of-government approach, along with individual agency goals and actions, to transform Federal procurement and operations to reduce greenhouse gas (GHG) emissions and environmental impacts and secure a transition to clean energy and sustainable technologies. EO 14057 builds upon EO 14008 and emphasizes the importance of the Federal Government's strategic planning, governance, financial management, and procurement to ensuring climate resilient operations.[30]
- Strengthening the Nation's Forests, Communities, and Local Economies (April 22, 2022): EO 14072 details ambitious mitigatory and adaptive goals through policy, restoration and conservation, stopping international deforestation, and deploying nature-based solutions (NBS). The United States aims to meet 2030 collective global goals to end natural forest loss and restore at least an additional 200 million hectares of forests and other ecosystems, while showcasing new economic models that reflect the services provided by critical ecosystems around the world.[31] *(Targets 9(d) and 10(c))*
- Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022 (September 12, 2022): EO 14082 establishes the White House Office on Clean Energy Innovation and Implementation, and aims to improve public health and advance environmental justice and economic opportunity for communities who disproportionately bear the brunt of cumulative exposure to industrial and energy pollution (Section 1c); expand research and accelerate innovation in the development of clean energy, climate, and related technologies (Section 1g); and build sustainable, resilient communities (Section 2i).[32]
- National Security Memorandum (NSM) on Strengthening the Security and Resilience of United States Food and Agriculture (November 10, 2022): NSM-16 details U.S. government policy and coordination in developing risk mitigation strategies including more frequent data collection and threat assessment analysis, promotion of efforts towards security of national infrastructure, and agricultural research towards climate-resilient technologies.[33] *(Targets 9(b), 10(a), and 10(b))*

- Revitalizing Our Nation's Commitment to Environmental Justice for All (April 21, 2023): EO 14096 details U.S. policy commitment to environmental justice, with the recognition that it requires investing in and supporting culturally vibrant, sustainable, and resilient communities in which every person has safe, clean, and affordable options for housing, energy, and transportation.[34] *(Targets 9(c) and 10(b))*
- Memorandum on Advancing Climate Resilience through Climate-Smart Infrastructure Investments and Implementation Guidance for the Disaster Resiliency Planning Act (November 29, 2023): M-24-03 provides climate-smart infrastructure best practices to Federal agencies for Federal financial assistance programs infrastructure and provides guidance on incorporating natural hazard and climate risk information.[35] *(Targets 9(e) and 10(a))*
- National Security Memorandum on Critical Infrastructure Security and Resilience (April 30, 2024): NSM-22 advances U.S. efforts to strengthen and maintain resilient critical infrastructure.[36]

Federal Climate Adaptation Plans

In 2014, Federal agencies first developed Climate Adaptation Plans (CAPs), which have subsequently been revised in 2021 and in 2024, reflecting the increasing maturity and expertise of Federal agencies to address climate risks to their operations and management and better serve their stakeholders in a changing climate, through changes in their policies and programs. Federal agency CAPs align with the government-wide approach to adaptation and resilience set forth in the Executive Orders described above, particularly EOs 14008, 14030, and 14057, as well as the objectives of the National Climate Resilience Framework. Key elements of the 2024-2027 CAPs include *(Targets 10(a), 10(b), 10(c), and 10(d))*:

- Combining historical data and projections to assess exposure of assets to climate-related hazards including extreme heat and precipitation, sea level rise, flooding, and wildfire;
- Expanding the operational focus on managing climate risk to facilities and supply chains to include Federal employees and Federal lands and waters;
- Broadening the mission focus to describe mainstreaming adaptation into agency policies, programs, planning, budget formulation, and external funding;
- Linking climate adaptation actions with other priorities, including advancing environmental justice and the Justice40 Initiative, strengthening engagement with Tribal Nations, supporting the America the Beautiful initiative, scaling up NBS, mobilizing the next generation of climate resilience workers through the American Climate Corps, and addressing the causes of climate change through climate mitigation; and

- Adopting common progress indicators across agencies to assess the progress of agency climate adaptation efforts.[37]

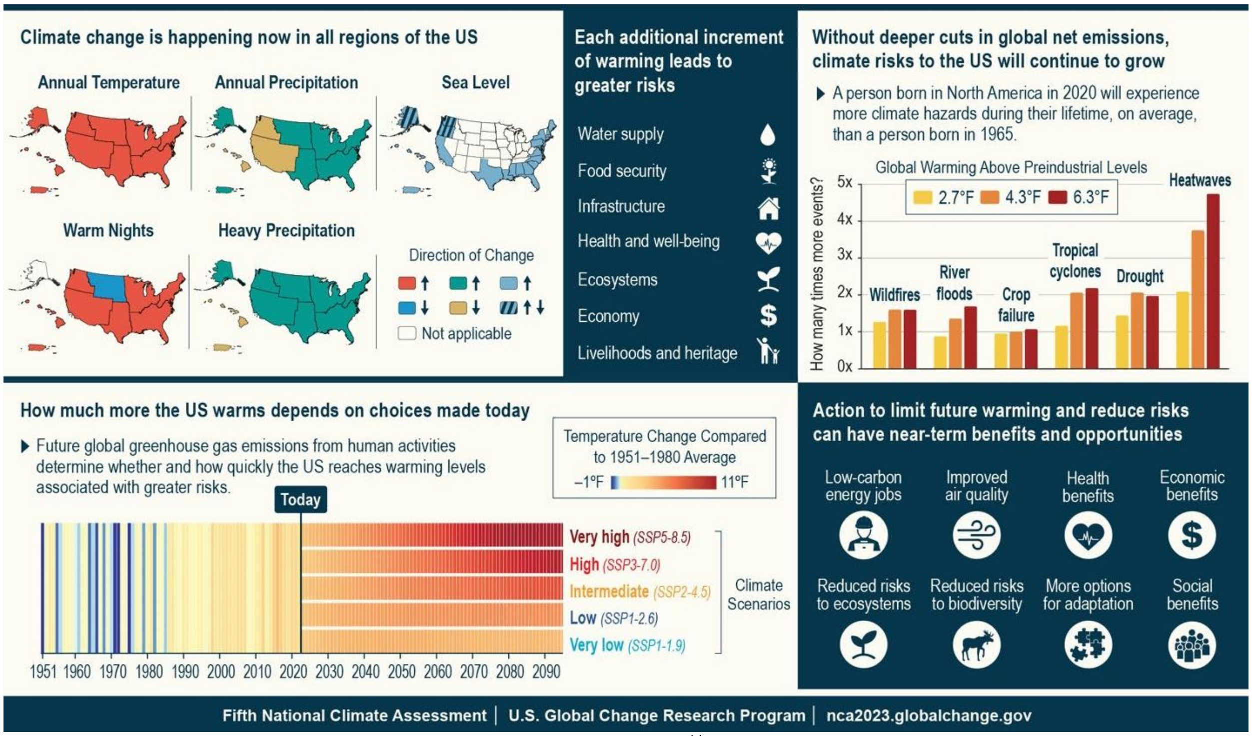
B. Impacts, Risks, and Vulnerabilities

Current and projected climate trends and hazards

In the United States, climate change is making it harder to maintain safe homes and healthy families, reliable public services, a sustainable economy, and strong communities. Many of the extreme events and harmful impacts that people are already experiencing will worsen as warming increases and new risks emerge.[38] Observations show an increase in the severity, extent, and/or frequency of multiple types of extreme events, as detailed in Figure 4-2. Heatwaves have become more common and severe in the West since the 1980s. Drought risk has been increasing in the Southwest over the past century, while at the same time rainfall has become more extreme in recent decades, especially east of the Rockies. Hurricanes have been intensifying more rapidly since the 1980s, with heavier rainfall and higher storm surges. More frequent and larger wildfires have been burning in the West in the past few decades due to a combination of climate factors, societal changes, and policies.[39]

Human activities—primarily emissions of greenhouse gases from fossil fuel use—are affecting climate system processes in ways that alter the intensity, frequency, and/or duration of many weather and climate extremes, including extreme heat, extreme precipitation and flooding, agricultural and hydrological drought, and wildfire.[40] The more the planet warms, the greater the impacts—and the greater the risk of unforeseen consequences. The impacts of climate change increase with warming, and warming is virtually certain to continue if emissions of carbon dioxide do not reach net zero. Rapidly reducing emissions would very likely limit future warming and the associated increases in many risks. The United States is actively mitigating emissions, including through a transition to zero emission vehicles, renewable energy sources, and the Federal Buy Clean initiative.

Figure 4-2: Climate Change Risks and Opportunities in the United States



Source: NCA5[41]

Observed and potential impacts of climate change, including sectoral, economic, social and/or environmental vulnerabilities

Climate impacts are occurring and are expected to intensify on every economic sector, demographic group, and region of the United States, but the effects will not be evenly distributed. Major areas of consideration for climate change in the United States include the below. *(Target 10(a))*

Energy

Energy supply and delivery are threatened by extreme weather, sea level rise, droughts, wildfires, and other climate-related hazards. These changes damage infrastructure and have profound effects on human lives and livelihoods, with already-overburdened communities bearing a disproportionate share of the risk. Efforts to enhance energy system resilience are underway, but significant investments will be required to achieve a resilient and decarbonized energy future.[42]

Agriculture and Food Security

Shifts in precipitation, air temperature, and soil moisture are disrupting agricultural production and food systems and are projected to reduce the availability and affordability of nutritious food. Climate change also compounds stressors on the marine ecosystem, which can create conditions that lower species abundance and exacerbate food insecurity and economic vulnerability for communities that rely heavily on fisheries and aquaculture. Impacts to food systems are distributed unevenly, with increased risks to the livelihoods and health of communities that depend on agriculture, fishing, and subsistence lifestyles, including Indigenous Peoples reliant on traditional food sources. Climate change also disproportionately harms food accessibility and the nutrition of women, children, older adults, and low-wealth communities.[43]

Human Health

Climate change is harming physical, mental, spiritual, and community health and well-being. There are increasing cases of infectious and vector-borne diseases and declines in food and water quality and security. Health impacts of climate change are felt disproportionately by communities and people who have been marginalized, including BIPOC (Black, Indigenous, and People of Color), low-wealth individuals, and sexual and gender minorities. Women, and particularly women of color, are more likely to live in communities of low wealth, which is associated with food insecurity, and exposure to particulate matter, extreme heat, and climate-related disasters. Further, a review of more than 30 million U.S. births revealed that women's heat exposure during pregnancy increased rates of low birth weight, preterm delivery, and stillbirth. Climate-related hazards will continue to grow, increasing morbidity and mortality across all U.S. regions.[44] These hazards put additional stress on health care facilities directly and indirectly (e.g., grid failures, road closures), jeopardizing access to care during and after events that may lead to negative health outcomes.

Coastal Changes

Coastal counties of the United States are home to 129 million people, or almost 40 percent of the total population.[45] The severity and risks of coastal hazards across the country are increasing, driven by accelerating sea level rise and changing storm patterns, resulting in increased flooding, erosion, and rising groundwater tables. Between 2000 and 2021, 38 tropical cyclones caused over $1 trillion in losses (in 2022 dollars) and 6,200 deaths. Between 2020 and 2050, coastal sea levels along the contiguous U.S. coasts are expected to rise about 11 inches (28 cm), or as much as the observed rise over the last 100 years. In response, coastal flooding will occur 5–10 times more often by 2050 than 2020 in most locations, with damaging flooding occurring as often as disruptive "high tide flooding" does now if action is not taken. This is affecting the resilience of coastal ecosystems and communities. The impacts of climate change and human modifications to coastal landscapes, such as through seawalls, levees, and urban development, are both limiting the capacity of coastal ecosystems to adapt naturally and are compounding the loss of coastal ecosystem services.[46]

Ecosystems

The interaction of climate change with other stressors is causing biodiversity loss, changes in species distributions and life cycles, and increasing impacts from invasive species and diseases, all of which have economic and social consequences. These risks are projected to grow with additional degrees of warming, as well as with increased atmospheric carbon dioxide, which contributes to the acidification of marine ecosystems.[47]

Water

Changes to the water cycle pose risks to people and nature. Alaska and northern and eastern regions of the United States are seeing and expect to see more precipitation on average, while the Caribbean, Hawaiʻi, and southwestern regions of the United States are seeing and expect to see less precipitation. Heavier rainfall events are expected to increase across the United States which, combined with changes in land use and other factors, is leading to increasing flood damage. Drought impacts are also increasing, as are flood- and drought-related water quality impacts. All communities will be affected, but in particular many Black, Hispanic, Tribal, Indigenous, and socioeconomically disadvantaged communities, face growing risks from changes to water quantity and quality due to the proximity of their homes and workplaces to hazards and limited access to resources and infrastructure.[48]

Approaches, methodologies and tools, and associated uncertainties and challenges

The observed and projected impacts of climate change are being tracked through a variety of climate information tools.[49,50,51,52] Climate information tools allow us to track not only the changes themselves, but also the impacts we are seeing today, and those that we can expect in the future. Tools like these are rapidly evolving from scientific exercises developed by and for technical experts, to more accessible information portals that allow non-experts to find and use information that they need.[53] While there is uncertainty in all forms of information, the Federal Government works hard to identify and describe the sources and levels of uncertainty in the climate data it produces. Federal laws, including the Information Quality Act, and the Evidence Act provide guidance and rules for the transparency and reliability of government data. Federal climate information is provided with high levels of documentation and transparency.

C. Adaptation Barriers and Priorities

Domestic priorities and progress towards those priorities

The United States developed the National Climate Resilience Framework to expand and accelerate climate change adaptation and resilience. This Framework identifies six core objectives that were developed by eight entities within the Executive Office of the President and more than 20 Federal agencies, informed by listening sessions with stakeholders and resilience experts from outside the government, and reports by the U.S. Government Accountability Office (GAO), the President's Council of Advisors on Science and Technology, and others.

The United States developed the National Climate Resilience Framework to identify key values, priorities, and objectives to help expand and accelerate nationally comprehensive, locally tailored, and community-driven climate change adaptation and resilience strategies. This Framework identifies six core objectives as critical to strengthening U.S. resilience to climate change impacts and making communities safer, healthier, more equitable, and more economically strong.

The United States has made unprecedented progress on each of the objectives. The following section presents a non-comprehensive list of recent actions taken and investments made by the Federal Government under each objective of the Framework.

Objective 1: Embed climate resilience into planning and management

Multiple studies show the benefits of proactively accounting for and building resilience to climate impacts.[54,55,56] Embedding climate resilience into planning and management reduces the adverse impacts of climate change, saves lives, and reduces the costs of damages. Research conducted by the National Institute of Building Sciences found that on average, every $1 spent by the Federal Government on disaster mitigation returns $2 to $13 in economic benefits.[57]

Recent actions and investments under Objective 1 (Target 10(c)):

- As described above, in June 2024, twenty-four U.S. Federal agencies released updated CAPs for 2024-2027 that expanded efforts to integrate considerations of adaptation and resilience into their operations and mission-delivery.[58,59] Some Federal agencies, including the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Agriculture (USDA), have developed sub-agency strategies to strengthen implementation and integration of adaptation and resilience into policies and programs.
- The U.S. Fire Administration works directly with communities in fire prone areas to help them become fire adapted. A fire-adapted community collaborates to identify its wildfire risk and works collectively on actionable steps to reduce its risk of loss.[60] The strategy is to have communities work with their local fire departments to create a written assessment of identified risks using a Community Wildfire Protection Plan (CWPP). A CWPP strategically documents local risks and creates an action plan to help everyone understand how making improvements to their home and the area around their home can create a more favorable outcome in the event of a wildfire.[61]
- The Federal Flood Risk Management Standard (FFRMS), reinstated by EO 14030 in 2021, helps to ensure investments are flood resilient. FFRMS applies to projects where Federal funds are used for new construction, substantial improvement, or repairs to address substantial damage. This can include projects such as critical infrastructure, affordable housing developments, renewable energy, or broadband internet projects. It also requires agencies to consider future flood risks, including those associated with climate change, when approving Federally funded projects.[62]

Objective 2: Increase resilience of the built environment to both acute climate shocks and chronic stressors

The built environment shapes the way people live, work, recreate, and interact. From housing, commercial buildings, and industrial facilities to transportation, power and water utilities, and public spaces and parks, every community's unique built environment is a significant determinant of quality of life. A resilient built environment—one that is constructed to the latest building codes, renovated to high-performance resilience standards, and located away from hazard zones where possible, while ensuring there is an adequate and affordable housing supply—protects people from climate impacts, supports quicker recovery from disruptions, and helps communities thrive.

Recent actions and investments under Objective 2 (Targets 9(e) and 10(c)):

- The Federal Emergency Management Agency's (FEMA) Building Resilient Infrastructure and Communities (BRIC) Program[63] and other hazard mitigation assistance programs have been supported and expanded by the BIL. Additionally, FEMA guidance[64] published in 2022 made clear that BRIC funds may be available to cover the cost of extreme heat mitigation plans, climate-smart buildings (retrofits, heating/cooling systems), resilience hubs, and other projects with heat-reduction co-benefits.

- The BIL is providing the Bureau of Reclamation $8.3 billion to enhance the resilience of water infrastructure across the West to drought and climate change, which directly supports community resilience.[65]
- The Mitigation Framework Leadership Group established the National Initiative to Advance Building Codes (NIABC) to help communities adopt the latest consensus building and energy codes and standards; improve climate resilience; and reduce energy costs. In 2023, the NIABC Best Practices Document was developed to enhance hazard risk reduction.[66]
- DOE's Grid Deployment Office is administering a $10.5 billion Grid Resilience and Innovation Partnerships (GRIP) Program to enhance grid flexibility and improve the resilience of the power system against growing threats of extreme weather and climate change. In August 2024, DOE announced the latest investment of $2.2 billion in the grid for eight projects that will protect against growing threats of extreme weather events, lower costs for communities, and catalyze additional grid capacity to meet load growth.[67]
- The Department of Health and Human Services (HHS) Low Income Home Energy Assistance Program (LIHEAP) provides Federally funded assistance to reduce the costs associated with home energy bills, energy crises, weatherization, and minor energy-related home repairs. HHS has issued guidance on using LIHEAP funds to protect communities from extreme heat and wildfire smoke, including by allowing grantees to distribute or loan efficient air conditioning units. In Fiscal Year 2024, the LIHEAP Program issued over $4.13 billion to grant recipients.[68]
- The Office of Management and Budget (OMB) provided guidance, for the first time, to executive branch agencies to consider NBS when designing resilient infrastructure. OMB emphasized that NBS should not be an afterthought in the climate fight, but rather a starting point for building resilience, to ensure communities benefit from investments for decades to come.[69]
- The U.S. Army Corps of Engineers is evaluating suppliers' locations, infrastructure, and vulnerability to climate-related risks, including identifying critical supply chain nodes vulnerable to climate change impacts, such as ports, warehouses, and transportation routes.[70]

Objective 3: Mobilize capital, investment, and innovation to advance climate resilience at scale

There is tremendous opportunity to further harness U.S. innovation capacity towards climate resilience. Building a climate-resilient country will require development, improvement, and scaling of advanced water treatment systems and drought-tolerant crops, efficient cooling technologies and building materials that reflect heat and insulate, forecasting and surveillance systems to track extreme events and impacts, and myriad other solutions. Mobilizing capital, investment, and innovation in climate resilience will help the United States better prepare for climate impacts and position the country at the forefront of a global climate resilience market that could be worth as much as $2 trillion per year by 2026.[71]

Recent actions and investments under Objective 3 (Targets 10(b) and 10(c)):

- The BIL has provided $3.5 billion to FEMA's Flood Mitigation Assistance grant program to proactively improve community flood resilience and elevate at-risk homes and buildings above flood levels.[72]
- Through the IRA, the National Oceanic and Atmospheric Administration (NOAA) is investing $2.6 billion to improve resilience of coastal communities and marine resources.
- The Bureau of Indian Affairs at the Department of the Interior is investing $220 million for Tribal climate adaptation and resilience, including Youth Service Corps projects and the National Seed Strategy Keystone Initiative.[73]
- In July 2024, the United States released the first-of-its kind Climate Resilience Game Changers Assessment. The Assessment identifies 28 critical technologies, management practices, and institutional and financial tools that can drive transformative positive impacts on our nation's climate resilience while creating good-paying jobs, improving community well-being, and advancing environmental justice.[74]
- The U.S. EPA's $14 billion National Clean Investment Fund will deploy clean technology and NBS to combat climate change, while also delivering benefits such as flood and urban heat mitigation, job training, and brownfield redevelopment to communities.[75]
- Leveraging the power of the private sector, a $1 billion commitment was made from private sector investors to make climate progress through agroforestry, sustainable water management and other NBS.[76]
- The U.S. Department of Homeland Security Science and Technology Directorate in collaboration with the U.S. Fire Administration deployed 200 Alpha phase wildfire sensors throughout the United States to provide early fire alerts and warnings. Since 2020, the sensors have collected over 1,000,000 hours of data in the field to enhance the Artificial Intelligence (AI) learning algorithms now being deployed in the Beta

version, which requires less solar power to recharge, is equipped with wind sensors to increase the accuracy of wildfire location prediction and has better ability to operate in areas with limited cellular coverage. Two hundred additional beta wildfire sensors were deployed in 2024 to high-risk areas across the United States for operational testing and evaluation, including the 80 sensors across the Hawaiian Islands.[77]

- The Department of Defense (DOD)'s Tyndall Air Force Base is working with local, state, and national partners to build an "Installation of the Future," which includes using updated building codes that capture future conditions and constructing living shorelines adjacent to the base to preserve water quality, enhance overall ecosystem health, and strengthen flood resilience.[78]
- In 2023, USDA expanded its Hurricane Insurance Protection-Wind Index Endorsement with a Tropical Storm Option after working directly with farmers to improve coverage.[79]
- FEMA's BRIC national competition selected 124 projects across 115 communities, including the installation of new sewer mains in Detroit's Jefferson Chalmers neighborhood to protect over 600 homes from flooding, and making storm drainage improvements in Greenville, North Carolina to reduce flood risk for 90 homes.[80]
- EPA's Environmental & Community Change Grants are funding $2 billion in IRA investments for environmental and climate justice activities to benefit disadvantaged communities through projects that reduce pollution, increase community climate resilience, and build community capacity to respond to environmental and climate justice challenges.[81]
- The Department of the Interior announced $120 million in 2024 to fund climate resilience projects for 102 Tribes and nine Tribal organizations. The program is part of a nearly $560 million investment for Tribal climate resilience programs through the Department's Bureau of Indian Affairs, funded through the Bipartisan Infrastructure Law, Inflation Reduction Act, and annual appropriations. In addition to the Tribal Climate Resilience Program, the Volunteer Community-Driven Relocation Program was launched with $115 million of funding plus $17 million from FEMA and $2 million from the Denali Commission. This funding is part of more than a collective $50 billion invested by the President's Investing in America agenda to advance climate adaptation and resilience across the nation, including in communities that are most vulnerable to climate impacts.[82,83]
- HHS educates safety net health care providers about funds for resilience investments like microgrids, onsite renewable energy generation, and energy efficiency improvements made available through the Inflation Reduction Act. These funds have helped support numerous projects, including a first-of-its-kind pilot program at Boston Medical Center that provides solar energy credits to patients who report difficulty affording household utility payments.[84]

Objective 4: Equip communities with information and resources needed to assess their climate risks and develop the climate resilience solutions most appropriate for them

There is no one-size-fits-all approach to building climate resilience; communities experience climate change in different ways and respond according to their unique capabilities and cultures. A key objective of climate resilience efforts should therefore be to ensure that communities are equipped to assess their risks and prepare accordingly. Central to this approach is providing communities with evidence-based and easy-to-use information, tools, and services.

Recent actions and investments under Objective 4 (Targets 10(a) and 10(c)):

- The NCA Atlas, published with NCA5, is a resource to help Americans anticipate how changing climate conditions might affect their homes and businesses.[85]
- EPA offers a variety of technical and outreach materials to raise public awareness to help policymakers make informed decisions about climate change impacts.[86]
- NOAA invested $12.7 million to advance its Climate Smart Communities Initiative (CSCI). CSCI supports communities in identifying and using climate science data and tools to understand their exposure to climate-related hazards, and to use that information to create and implement climate resilience plans.[87]
- NOAA is dedicated to improving climate projections and advancing research, modeling, prediction, information dissemination, and service delivery for disasters such as wildfires, drought, floods, and heat. This includes $50 million to collect and disseminate actionable, placed-based climate information, $35 million to improve projections, predictions, and models, and $85 million to use “proving grounds” to develop and test products and services for the private sector to improve delivery of climate data and services.[88]
- FEMA produces flood maps and risk assessments to help communities know which areas have the highest risk of flooding.[89]
- The U.S. Department of Housing and Urban Development (HUD)’s Community Resilience Toolkit has been curated to help recipients of HUD Community Planning and Development funds identify ways to use their funding to mitigate the impacts of natural hazards, with key sections dedicated to increasing temperatures and extreme heat, wildfire, and drought.[90]
- In 2024, the United States launched multiple resources to support agencies and their partners in implementing the FFRMS, including the Federal Flood Standard Support Tool and the FFRMS Floodplain Determination Job Aid.[91]

- NOAA is providing $4.9 million for the agency's labs and research partners to improve drought monitoring and prediction in the American West.[92]
- NOAA is using $5 million in IRA funding to establish two virtual research centers – the Center for Community Climate and Health Observations, Monitoring, and Evaluation and Center for Climate and Health Assessments, Policy, and Practice – to provide technical assistance and other support to local communities and governments on improving resilience to extreme heat.[93]
- NOAA and the Center for Disease Control and Prevention created the National Integrated Heat Health Information System (NIHHIS) as an interagency information system to develop and provide actionable, science-based information to help decision-making and protect people from heat.[94]
- The Climate Mapping for Resilience and Adaptation (CMRA) helps people assess their local exposure to climate-related hazards. It also helps communities identify potential Federal funding opportunities that can be used to plan and implement climate resilience plans.[95]
- In March 2024, DOE announced a $90 million in funding to support building energy code adoption, training, and technical assistance at the state, Tribal, and local level.[96]
- August 2024, the U.S. Fire Administration developed and launched two new geospatial tools to improve wildfire awareness and prevention messaging in communities. The Wildland Urban Interface (WUI) Fire Property Awareness Explorer and the WUI Fire Community Awareness Explorer provide an initial data-informed basis for residents to "Know Where You Live" in proximity to the location of the WUI and fire-prone areas. This knowledge helps individuals learn to reduce combustible fuels around their home and create defensible space in fire prone areas.[97]
- The NOAA Climate Adaptation Partnerships (CAP) is an applied research and engagement program that expands society's regional capacity to adapt to climate impacts in the United States. The CAP program supports sustained, collaborative relationships that help communities build lasting and equitable climate resilience.[98]

Objective 5: Sustainably manage lands and waters to enhance resilience while providing numerous other benefits

U.S. lands, waters, and oceans and the many important services that they provide to nature and society, are at increasing risk due to climate change. Agricultural production has been affected by increases in temperatures affecting farmworker health and more occurrences of heat stress in livestock, as well as more frequent extreme weather events that include drought and flooding that reduce crop yield. Critical ocean habitats, like California's kelp forests and

Florida's coral reefs, have declined by 90 percent in less than 10 years due to above normal ocean temperatures and increased ocean acidification.[99,100] Forests are experiencing more frequent and intense wildfires often turning them from an important tool in the fight against climate change (a carbon sink) into the opposite (a carbon emission source). Water temperatures in freshwater lakes and rivers are warming, creating breeding grounds for the spread of invasive species. Climate impacts not only affect biodiversity, but are also altering the way humans, animals, and environments interface, contributing to disease spread and outbreaks among vulnerable species. Investments in nature through conservation and restoration are critical for managing these impacts and are equally integral as solutions to the climate crisis.

Recent actions and investments under Objective 5 (Targets 9(a), 9(d), 10(a), 10(b), 10(c)):

- The Bureau of Reclamation at the Department of the Interior made available up to $125 million to support the relaunch of a System Conservation Pilot Program, a voluntary conservation program in the Upper Colorado River Basin.[101]
- The Department of the Interior's (DOI) WaterSMART Initiative invested over $427 million for 127 projects across all seven Colorado River Basin states in fiscal year 2022 to help farmers and ranchers conserve water and build drought resilience in their communities. WaterSMART partnered with the USDA's Natural Resources Conservation Service (NRCS) to coordinate investments in priority areas and help accelerate water conservation in individual communities to make a bigger impact where it is needed most.[102]
- In 2023, USDA announced the Western Water and Working Lands Framework for Conservation Action, a comprehensive, multi-state strategy under USDA NRCS to address key water and land management challenges across 17 Western states. The Framework includes guidelines for identifying vulnerable agricultural landscapes and 13 strategies to help NRCS state leaders, water resource managers, and producers respond to priority challenges.[103]
- In January 2022, USDA's Forest Service launched a robust, 10-year strategy to address the wildfire crisis in the places where it poses the most immediate threats to communities. The strategy, titled "Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests," combines a historic investment of congressional funding with years of scientific research and planning into a national effort that will dramatically increase the scale and pace of forest health treatments over the next decade.[104] Through the strategy, USDA's Forest Service will work with states, Tribes, and other partners to address wildfire risks to critical infrastructure, protect communities, and make forests more resilient.

- In July 2024, USDA NRCS announced $90 million from the IRA for Conservation Innovation Grants that include over 50 projects to develop new tools, practices, and technologies that advance natural resource conservation on private lands, including a range of projects that support adaptation and resilience.[105]
- In June 2024, NOAA announced over $16 million in awards to drive innovation in marine science and technology—including investments in critical climate adaptation technologies that address ocean acidification and enhance monitoring of the ocean and marine biodiversity.[106]
- In May 2024, the Department of the Interior announced $179 million to fund innovative drought resilience projects, including water recycling and groundwater recharge that will meet the average annual water needs of hundreds of thousands of people.[107]
- The Wildland Fire Mitigation and Management Commission, co-chaired by USDA, DOI, and FEMA, released its 2023 report outlining a comprehensive, consensus-based set of recommendations to Congress to address the nation's wildfire crisis.[108]
- USDA's Forest Service's Urban and Community Forestry Grants are investing $1 billion in nearly 400 projects across the country—in partnership with community organizations, state, local, Tribal, and territorial partners, public colleges and universities, and nonprofits—working to provide equitable access to nature and their benefits to urban communities.[109]
- USDA's Forest Service Community Wildfire Defense Grant Program is a $1 billion grant program intended to help at-risk local communities and Tribe's plan for and reduce wildfire risk. Projects include nearly $10 million for the Cherokee Nation in Oklahoma to get needed equipment to reduce wildfire risk; nearly $6 million to Wasco County, Oregon to create fuel breaks and defensible space to protect communities; and nearly $9.9 million to The Nature Conservancy in Colorado to protect communities and watersheds in Archuleta County.[110]

Objective 6: Help communities become not only more resilient, but also more safe, healthy, equitable, and economically strong

A community's climate resilience is closely linked to its economic, social, and physical wellbeing. Communities with diverse economies, strong civic engagement, food and water security, and access to essential services like equitable transportation, affordable housing and health care will be more resilient to climate threats. For example, investments in a community's health care system—including in medical supply chains, health care facilities, and outreach networks—will improve not just the overall health and well-being of community members during normal operations, but also their capacity to mitigate, adapt to, and recover from the impacts of extreme weather events, long-term climate stresses, and other compounding factors. Moreover, individuals with underlying health conditions tend to be more vulnerable to extreme weather events, such as heat waves, meaning that certain measures that improve community health can also improve climate resilience.

Recent actions and investments under Objective 6 (Targets 9(c), 10(a), 10(b), 10(c), 10(d)):

- USDA provided nearly $680 million in Emergency Relief Program funding for agricultural producers impacted by natural disasters, including drought, in the seven Colorado River Basin states in 2020 and 2021, as well as nearly $180.9 million in payments for livestock producers impacted by drought in 2020 and 2021 through the Emergency Livestock Relief Program.[111]
- NOAA's NIHHIS Urban Heat Island Mapping Campaign[112] launched heat island mapping campaigns in an additional 154 communities across 14 states, adding to a growing list of over 70 communities that have measured higher heat stress.[113]
- HHS and NHTSA's Emergency Medical Services (EMS) HeatTracker is helping to track EMS responses to heat-related emergencies.[114]
- In 2022, HHS published a Dear Colleague Letter[115] making clear that Community Services Block Grant (CSBG) Program funding can be used for summer crisis assistance and disaster response to mitigate the effects of heat stress and extreme heat events. In 2024, HHS published another Dear Colleague Letter exploring CSBG flexibilities to support communities responding to the impacts of wildfires, including outdoor workers like farmworkers. HHS CSBG funding is approximately $750 million annually.[116]
- In 2024, HHS announced that the Quality Improvement Organization Program will, for the first time, offer funding for climate change and emergency preparedness work, totaling $63 million for this technical assistance. The Quality Improvement Organization Program is dedicated to improving health quality for people with Medicare.[117]
- In 2023, the HHS announced $65 million to strengthen hurricane response and emergency preparedness at health centers and ensure communities in hurricane-prone areas have continuous access to primary care services during future emergencies.[118]
- In June 2024, the Department of Commerce and NOAA announced $60 million in funding to help train and place people in jobs that advance a climate-ready workforce for coastal and Great Lakes states, Tribes, and territories.[119]
- The BIL provides more than $135 million to support voluntary, community-led transition and relocation for Tribal communities severely threatened by climate change and accelerating coastal hazards.[120]
- A total of $75 million in funding from FEMA was awarded to support community driven Tribal relocation efforts in Alaska (Newtok Village and Native Village of Napakiak) and Washington (Quinault Indian Nation).[121]

- The Occupational Safety and Health Administration (OSHA)'s National Emphasis Program on Outdoor and Indoor Heat was launched in March 2021 to protect millions of workers from heat illness and injuries. Through the program, OSHA conducts heat-related workplace inspections.[122]
- In September 2024, the HHS Centers for Disease Control and Prevention National Institute for Occupational Safety and Health published its first-ever Hazard Review on wildland fire smoke. The draft Hazard Review presents evidence-based recommendations to protect outdoor workers, including farmworkers, construction workers, oil and gas workers, park rangers, emergency responders, and others from the adverse health effects of occupational exposure to wildland fire smoke.[123]

Adaptation challenges, and gaps and barriers to adaptation

Although adaptation is occurring across the United States, barriers remain. These barriers can be addressed with financial, cultural, technological, legislative, or institutional changes. More actors are adapting to climate change, including government, private industry, and civil society, and each sector and group has unique needs and expectations that require differing approaches and focus. Further, there is a growing recognition of the need to consider and plan for compound and complex conditions with multiple stressors.

It is also important to distinguish between planning for adaptation and actually implementing adaptation strategies; there is still more of the former than the latter. The ability to adapt is uneven and inequitable: communities or businesses with means, wealth, or access to resources are more able to adapt, while those with fewer means or opportunities are less able to adapt. The gap between planning and action could also reflect the ease of tracking adaptation plans compared to tracking evidence of systems, people, or environments that are adapting, which can take years to show progress. Without monitoring and evaluation of adaptation investments and adaptive capacity, it is challenging to measure progress, continually improve, and understand the overall impact of adaptation actions and investments.

Few regulatory requirements focus directly on adaptation. Existing environmental and disaster policies, frameworks, and governance systems are not yet designed to handle the long-term, widespread transformative changes needed to adapt to climate change; tend to be reactive rather than proactive; and assume fixed rather than dynamic environments. While significant progress has been made on methodologies and tools to assess climate risks and adaptation options, users often struggle to determine the best tool or find actionable information tailored to their needs. Clear pathways for sharing datasets and tools among multiple actors and jurisdictions are lacking, as are streamlined and transparent processes for integrating local, traditional, and Indigenous Knowledge.

The diversity of values and goals held by different public entities and organizations, as well as differentiated responsibilities across levels of government or types of organizations, can create challenges in developing shared goals. Effective adaptation governance requires coordination across government agencies at all scales and with diverse actors.

Adaptation that does not explicitly address uneven vulnerability, and the social processes that drive these disparities, can exacerbate social inequities and climate impacts.[124] While progress is being made, barriers still exist to centering justice and equity in domestic adaptation. In many settings, there is not a widely accessible forum for local participation, particularly of Indigenous and rural communities living in remote and vulnerable locations. Social hierarchies and structures can prevent overburdened groups from sharing their opinions, preventing achieving equitable adaptation. Frontline communities are hit first and worst by climate change, and oftentimes adapting to climate change may not be their immediate concern. Intentionally centering equity in adaptation solutions in partnership with frontline communities has the potential to improve some systemic issues such as inequality, discrimination, and limited access to essential resources and opportunities.

Finally, adaptation requires additional investment and funding. Communities with the highest climate vulnerability do not have adequate and equitable access to available adaptation funding. Organizations often do not understand potential returns on investment in adaptation, so there is less appetite for expensive measures.[125] Investment in adaptation can also be challenging to justify in an environment of competing priorities and limited resources. This can be exacerbated by the temporal misalignment between the costs and benefits of adaptability. For example, purchasing a sufficient real estate footprint around a levee to allow for later levee raises as sea levels change is a present-day cost, but its benefit is not incurred until after sea levels rise and the levee is raised. Comparing heavily discounted future benefits against undiscounted present-day costs can reduce the economic incentive for adaptation under traditional cost-benefit analysis.

D. Adaptation Strategies, Policies, Implementation, and Monitoring

Implementation of adaptation actions in accordance with the global goal on adaptation as set out in Article 7, paragraph 1, of the Paris Agreement

The United States is currently advancing climate adaptation and resilience across the country, including in communities that are the most vulnerable to climate impacts. These actions aim to enhance adaptive capacity by mobilizing investments to scale climate resilience and embedding climate resilience into strategic planning and management; strengthening resilience by fortifying the built environment to climate and weather events and chronic stressors as well as protecting and sustainably managing lands and waters to enhance resilience; and reducing vulnerability to climate change by equipping communities with information and resources needed to assess their climate risks and develop appropriate climate resilience solutions and helping communities become safer, healthier, more equitable, and more economically strong. Section C: Domestic Priorities enumerates many of the adaptation actions that are currently being implemented.

Adaptation goals, actions, objectives, undertakings, efforts, plans (e.g. national adaptation plans and subnational plans), strategies, policies, priorities (e.g. priority sectors, priority regions or integrated plans for coastal management, water and agriculture), programmes and efforts to build resilience

The United States is in the process of implementing an array of programs and projects supported by the Federal Government that shape and prioritize national climate resilience. Many are detailed in Section C: Domestic priorities. The BIL and IRA represent over $85 billion in Federal support for national and subnational adaptation efforts; select efforts are listed below. Through these plans, the United States sets priorities to expand climate management for coastal and vulnerable communities, water-related infrastructure, agriculture and energy resilience, and much more. *(Target 10(b))*

Bipartisan Infrastructure Law

Transportation and infrastructure

This $30 billion investment includes extensive funding toward rehabilitation and adaptation of infrastructure, flood management, evacuation planning and support, and other community resilience measures to ensure sustainable and justice-oriented climate development. Notably, the BIL includes $8.7 billion for the Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) program to support resilience of transportation infrastructure in at-risk coastal communities. These efforts align with the United States' climate adaptation goals by prioritizing the development of resilient infrastructure that can withstand extreme weather events and climate impacts. Through the BIL, the United States prioritizes building resilience in vulnerable regions by providing the needed support for national and subnational adaptation plans, integrated coastal management strategies, and water resource management policies.

Energy and Grid Resilience

This $26 billion investment includes significant efforts towards enhancing the resilience of the electric grid and the reliability of the U.S. energy supply. BIL dedicates funding to national and subnational programs, projects, and agencies to prevent outages, upgrade grid infrastructure, and support innovative approaches to energy storage and distribution. Additionally, it covers wildfire management strategies, energy efficiency programs, and initiatives to improve energy reliability in rural and remote areas. These actions are crucial for achieving the United States' climate adaptation objectives by ensuring a stable and resilient energy supply for all communities. By supporting national adaptation plans, energy policies, and resilience-building programs, the United States can best prepare itself for the risks posed by climate change to the energy sector.

Environmental and Ecosystem Restoration

This $10.5 billion investment includes wide-ranging measures to restore and protect ecosystems, improve water and air quality, and advance U.S. adaptation efforts through NBS. Key initiatives prioritize the impacts of climate change on vulnerable communities through the enhancement of natural landscape resilience, investing in habitat restoration for coastal resilience, support for conservation and revegetation projects, and mitigating wildfires. The United States sees these efforts as integral to its climate adaptation strategies, as they promote the health and resilience of ecosystems that provide critical services and protection against climate impacts. The initiatives aim to be integrated and align with national and subnational adaptation plans, conservation policies, and streamlined approaches to managing water, agriculture, and coastal regions, thereby contributing to overall resilience of the environment and communities.

The Inflation Reduction Act

The IRA allocates $20.5 billion towards various initiatives aimed at mitigating drought, reducing air pollution, making renewable energy and energy storage technologies available to communities, improving ecological integrity, expanding data collection and availability, enhancing coastal and community resilience, and building the capacity of disadvantaged communities to engage with state and Federal decision-making process. Key allocations include drought mitigation in the Colorado River Basin, urban tree canopy projects, sustainable retrofits for HUD-assisted housing, collaboration with private forest landowners, and significant support for Tribal climate resilience planning.

Ocean Climate Action Plan

In March of 2023, the first-ever Ocean Climate Action Plan (OCAP) was released to harness the power and capacity of the ocean to address the climate crisis. Since the release of the OCAP, Federal agencies have advanced ocean actions that align with the plan's three goals: (1) create a carbon-neutral future, without emissions that cause climate change and harm human health, (2) accelerate NBS, and (3) enhance community resilience to ocean change by developing ocean-based solutions that help communities adapt and thrive in our changing climate.

Accomplishments include the release of the first ever Ocean Justice Strategy; investment of $2.6 billion to enhance coastal community resilience and restore marine resources, including nearly $400 million for Tribal priorities; establishment of a Marine Carbon Dioxide Removal Fast Track Action Committee, and the release of the U.S. Ocean Acidification Action Plan.

How best available science, gender perspectives and Indigenous, traditional, and local knowledge are integrated into adaptation

U.S. climate adaptation strategies are Federally initiated and supported but incorporate a diverse range of perspectives and are guided by the local knowledge of the communities and peoples that are implementing national efforts to build resiliency. At every level, the United States works to ensure that the best available science holds together the fabric of the multiplicity of actors that work together to advance adaptation through both national and subnational policy and development. In January of 2021, a series of EOs and memorandums were released with the aim of reinforcing scientific power and integrity throughout the U.S. government *(Target 9(c), 9(f), 9(g), and 10(b))*:

- EO 13990 on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis;[126]
- EO 14007 establishing the President's Council of Advisors on Science and Technology;[127]
- Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking.[128]

U.S. adaptation actions are guided by and seek to empower the communities they serve, this includes taking a gender-responsive approach to climate adaptation. The United States recognizes that gender-responsive climate action is necessary to achieve our climate goals. This is demonstrated, for example, through the National Strategy on Gender Equity and Equality, which calls for people of all genders to be fully empowered as leaders at all levels to advance climate goals, including climate adaptation strategies and climate disaster response.[129]

Indigenous and Traditional Knowledge has played a large role in the development of national climate adaptation strategy. The United States continues to dedicate significant resources towards collaboration with and empowerment of Tribal climate resiliency. Not only is Indigenous expertise critical to the success of their adaptation goals, but for many Indigenous Peoples and Tribal Nations, stewardship of lands and waters is integral to their cultural identity. Such perspectives lead to different adaptation options with emphasis on active management designed to maintain reciprocal relationships with their ecosystems. For example, the Hopi Tribe have been adapting agricultural strategies to the impacts of drought for over 2,000 years.[130] Their soil-moisture techniques enable plants to adapt and grow in extreme conditions.

Collaboration and inclusion of Indigenous perspectives spans across adaptation efforts related to agriculture, forestry, and many other resiliency efforts. Examples of U.S. adaptation measures that have been guided by Indigenous Knowledge and values include:

- The Department of State and EPA, with guidance from DOI, launched a new interagency initiative in 2022, the Indigenous Peoples' Conservation Advisory Network (IPCAN), to support and uplift the leadership of Indigenous Peoples and their Knowledge in conservation, restoration, and sustainable management efforts in terrestrial, coastal, and ocean ecosystems. IPCAN is developed through robust consultation with global Indigenous stakeholders and facilitates a global, Indigenous-led network supporting Indigenous Peoples' stewardship of lands and waters that addresses the climate and biodiversity crises.
- In December 2022, the White House Council on Environmental Quality and the White House Office of Science and Technology Policy jointly, released government-wide guidance and an accompanying implementation memorandum for Federal agencies on recognizing and including Indigenous Knowledge in Federal research, policy, and decision making.[131]
- In 2022, the White House hosted two virtual roundtables with Native American Tribal and Alaskan Native leaders to discuss how the Administration will deliver for Tribal communities, including by providing resources from the BIL.[132]
- NOAA is using Climate and Equity Pilot Project funds to establish a Director of Tribal Climate Change Initiatives position at the Alaska Native Tribal Health Consortium, a non-profit Tribal health organization serving Alaska Native and American Indian people in Alaska. The director will lead a landscape assessment of Tribal climate change adaptation activities in Alaska and establish a baseline understanding of Tribal climate change challenges and responses.[133]

Development priorities related to climate change adaptation and impacts

The United States is making significant progress towards achieving the six objectives identified by the National Climate Resilience Framework, which encompass development priorities. A non-comprehensive list of recent actions and investments made by the Federal Government can be found in Section C: Domestic Priorities under each objective.

Any adaptation actions and/or economic diversification plans leading to mitigation co-benefits

U.S. climate strategies for adaptation and mitigation are in many ways symbiotic. While U.S. greenhouse gas emissions are falling, the current rate of decline is not sufficient to meet national and international climate commitments and goals. Adaptation actions will continue to play a critical role in benefitting mitigation efforts to bring the United States and the world closer to the goal of limiting warming to 1.5°C.

Adaptation measures can help to protect the globe’s natural carbon sinks and reduce the amount of GHG in the atmosphere. The implementation of NBS is especially effective in this manner. For example, the protection of forests and adaptive management of vegetation can both enhance natural carbon sinks and help to reduce the risk of wildfires. The restoration of coastal wetlands can both buffer coastal communities from storms and enhance carbon storage and sequestration. Adaptation actions such as these are integrated into national and subnational policy, initiatives and programs. The historic investment into U.S. climate initiatives from the BIL and IRA is supporting projects that advance both adaptation and mitigation.

Efforts to integrate climate change into development efforts, plans, policies and programming, including related capacity-building activities

Climate change is integrated into U.S. development efforts through national and subnational strategic planning, legislation, international cooperation, capacity-building, research, community engagement, financial investment, and monitoring. Key initiatives include the National Climate Resilience Framework and Federal Climate Adaptation Plans, which primarily focus on proactive climate adaptation and enhancing climate resilience. The IRA and BIL provide significant investments in clean energy and climate resilience projects, as well as the various initiatives mentioned in Section C: Domestic priorities.

Internationally, the United States aims to support climate adaptation and mitigation in developing countries and the global community. Agencies, such as the U.S. Agency for International Development (USAID), play a crucial role in capacity-building through the provision of technical assistance and training to enhance local resilience and reduce emissions. Research institutions develop new technologies and advance our understanding of climate change to inform policy and improve understanding.

Community engagement is fostered through public-private partnerships and community-based programs, ensuring that local stakeholders are involved in climate resilience planning and implementation. Financial investments, including climate finance and resilience funds, support both domestic and international climate projects. Monitoring and evaluation systems are being developed and established to track the effectiveness of these efforts and help ensure continuous improvement.

Overall, U.S. strategy is composed of a multi-faceted and integrated approach to addressing climate change, promoting sustainable development, and building resilience both at home and abroad.

Nature-based solutions to climate change adaptation

NBS are essential strategies that utilize natural processes and ecosystems to advance successful climate adaptation and mitigation efforts. In the United States, these solutions are integrated into efforts to enhance resilience, reduce greenhouse gas emissions, and provide a variety of benefits for biodiversity and human well-being. Recognizing the need to unlock the potential of NBS, the United States released the Nature-based Solutions Roadmap in 2022. This roadmap provides five strategic recommendations for Federal agencies to integrate NBS and other actions to pave the way.[134] *(Targets 9(d), 10(b), and 10(c))*

1. Update policies: Agencies should update Federal policies and guidance to make it easier to consider and use NBS.
2. Unlock funding: Federal agencies can rapidly reduce emissions and promote community resilience by integrating NBS into financial assistance and incentive programs.
3. Lead with Federal facilities and assets: Federal agencies have begun focused efforts to improve resilience in their facilities, operations, and programs. Federal facilities standards should require use of NBS, where appropriate, and standards should be updated as knowledge about NBS evolves.
4. Train the workforce: The next wave of good jobs can come from training an equitable, NBS workforce. Key skills are needed in planning, designing, building, and maintaining NBS.
5. Prioritize research, innovation, knowledge, and adaptive learning: Federal agencies can review existing research to identify gaps in understanding the effectiveness of NBS. Agencies should also develop interagency best practices for monitoring the full suite of NBS, including how best to measure and verify climate benefits.

Other key initiatives include ecosystem restoration and conservation, such as reforestation, afforestation, and wetland restoration, which help sequester carbon and improve air and water quality. Sustainable land management practices like agroforestry and soil conservation techniques are also employed to enhance soil health and increase carbon storage.

Coastal and marine initiatives, such as mangrove restoration and coral reef protection, play a crucial role in shielding coastal areas from storm surges and supporting marine biodiversity. Furthermore, conservation and restoration of marine and coastal ecosystems could capture and store enough atmospheric carbon each year to offset about 3 percent of emissions.[135] Urban green infrastructure, including green roofs, walls, and urban parks, helps mitigate urban heat islands, manage stormwater, and improve air quality. Watershed management practices, like establishing riparian buffer zones and integrated water resource management, aim to protect water quality and stabilize ecosystems. Of NBS investments, there are high returns on efforts to restore coastal ecosystems in particular, since U.S. coral reefs provide estimated adaptation benefits of more than $1.8 billion annually (dollar year not provided).[136]

Community-based conservation efforts engage local communities in managing natural resources, ensuring culturally appropriate and sustainable solutions. Incorporating Indigenous Knowledge into conservation practices further enhances the effectiveness of these initiatives. Policy and financial support, through incentive programs and regulatory frameworks, encourage the adoption and scaling of NBS. They are a vital component of the U.S. strategy to integrate climate change into development efforts, promoting resilient and sustainable environments that can adapt to and mitigate the effects of climate change.

While NBS offer specific benefits for climate mitigation and adaptation, including carbon sequestration and a degree of self-adaptability, successful NBS implementation should also recognize the particular vulnerabilities of these systems in a changing climate. Increased heat, fire, drought, invasive species, and altered water salinity and acidity can all be expected in a warming world, and all can negatively impact living and hybrid systems. Planning NBS with careful consideration of potential future hazards can help ensure success, as can investment in monitoring and maintenance.

Examples of U.S. policies, plans, and reports referenced in this report that integrate NBS into adaptation action are included below.

- Opportunities to Accelerate Nature-Based Solutions
- National Climate Resilience Framework
- Federal Climate Adaptation Plans
- Inflation Reduction Act
- Bipartisan Infrastructure Law

- National Climate Assessment
- USAID Climate Strategy
- Green Climate Fund Contributions
- Conservation Reserve Program
- Environment Quality Incentives Program
- Urban Green Infrastructure Initiatives
- America the Beautiful Initiative

Stakeholder involvement, including subnational, community-level and private sector plans, priorities, actions and programmes

U.S. climate adaptation efforts involve numerous stakeholders, including subnational actors, community-level organizations, and the private sector. Subnational stakeholders (including state, territorial, Tribal, local, and private entities) play a crucial role in implementing climate policies and initiatives at regional and local levels. Many of these subnational stakeholders, such as cities and municipalities, have developed their own climate action plans that align with national goals but are tailored to local conditions and priorities. These plans often include NBS, renewable energy projects, and resilience-building measures. Additionally, subnational entities often collaborate through regional initiatives, such as the Regional Greenhouse Gas Initiative, to collectively address climate change and share best practices.

Community-level stakeholders are essential to ensure climate initiatives are culturally appropriate, sustainable, and effective. Local communities are engaged in managing and conserving natural resources through stewardship programs that incorporate Indigenous and traditional ecological knowledge and practices. Community members are involved in the planning and implementation of climate resilience projects, ensuring that local needs and priorities are addressed. Community organizations also conduct education and awareness campaigns to inform residents about climate change impacts and encourage sustainable practices.

The private sector is a key partner in driving innovation, investment, and implementation of climate solutions. Public-private partnerships facilitate collaborations between government agencies and private companies to develop and implement climate solutions, such as renewable energy projects, energy efficiency programs, and green infrastructure. Many companies have adopted sustainability goals and practices, such as reducing carbon footprints, investing in renewable energy, and supporting conservation projects. Private sector companies also invest in research and development of new technologies for renewable energy, energy storage, carbon capture, and other climate solutions.

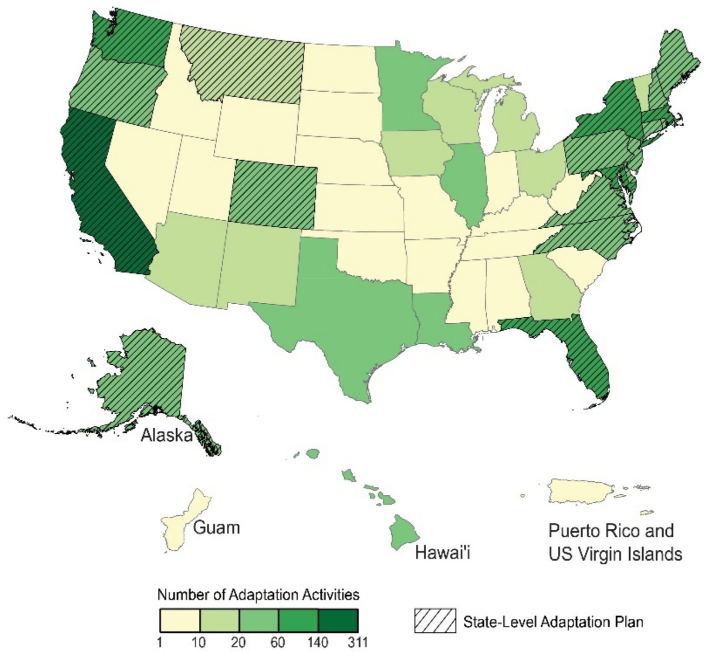
E. Progress on Implementation of Adaptation

Implementation of the actions identified in Section D above

The United States has made significant strides in ramping up climate adaptation efforts as identified in Section D above, signaling an increased commitment to addressing the growing threats posed by climate change. Through the development of institutional frameworks such as the National Climate Resilience Framework and the enactment of major legislation such as the IRA and BIL, the U.S. government has substantially expanded its climate resilience efforts. These actions represent a pivotal shift in the scale and ambition of adaptation measures, with notable progress seen in the number of initiatives launched, funding allocated, and communities engaged in building resilience to climate impacts.

Efforts to adapt to climate change and reduce net greenhouse gas emissions are underway in every U.S. region and have expanded in recent years. Actors, stakeholders, and rights-holders – from individuals and organizations to companies, communities, and government entities across all levels, regions, and sectors – are already investing in adaptation measures to reduce the harms caused by climate change and leverage new opportunities to enhance their ability or capacity to adapt as seen in Figure 4-3.

Figure 4-3: Number of Publicly Documented Adaptation Activities (2018-2022)



Source: NCA5[137]

Steps taken to formulate, implement, publish, and update national and regional programmes, strategies and measures, policy frameworks (e.g. national adaptation plans), and other relevant information

Many state governments and organizations have individual sustainability, resilience, or adaptation plans. Eighteen states have climate adaptation plans, and another six states have plans underway. Thirty-two states lack a public adaptation plan, a select few U.S.-based companies have disclosed adaptation-related actions they are taking, and very few jurisdictions have adaptation plans co-designed between the public and private-sectors. Across jurisdictions, plans are developed for different reasons such as climate impacts, investor requests, regulatory requirements. As required in Executive Orders 14008 and 14057, more than 20 Federal agencies have prepared and updated climate adaptation plans.[138] *(Target 10(b))*

Climate adaptation-related congressional legislation is becoming more prevalent, often embedded within other topics (e.g., infrastructure, disaster relief, water).

Other actions, including national and regional programs, strategies and measures, and policy frameworks are detailed in Section A, C, and D of this chapter.

Implementation of adaptation actions identified in current and past adaptation communications, including efforts towards meeting adaptation needs, as appropriate

In 2021, the United States submitted its first Adaptation Communication (AC) outlining U.S. major domestic and international climate adaptation initiatives. Since its submission, the United States has made substantial progress in the implementation of the adaptation actions identified in the AC. The breadth of efforts towards meeting adaptation needs is detailed in Section C and D of this chapter.

Coordination activities and changes in regulations, policies and planning

Federal agencies are incorporating consideration of climate impacts and adaptation actions in Federal policies and guidance, where relevant. For example, USDA's Forest Service is updating or proposing climate-informed revisions to guidance and policies related to silviculture practices, beneficial uses of forest restoration byproducts, recreation, and designated areas planning, habitat and water resource management, and forest-level land management planning. The Department of Veterans Affairs is integrating health, demographic, and climate change information to anticipate the effects of climate change on Veterans' health and plan for adjustments to their program delivery in the future. EPA is integrating consideration of climate risks into multiple actions as appropriate and where consistent with its statutory authorities such as in the development of rules, policy and guidance; permitting and environmental reviews; in monitoring, enforcement, and compliance activities; and in grant making.

For examples of further coordination activities, please refer to Section A: Institutional Arrangements and Governance.

F. Monitoring and evaluation of adaptation actions and processes

Establishment or use of domestic systems to monitor and evaluate the implementation of adaptation actions

Systems to monitor and evaluate the implementation of adaptation actions at different scales are still in development or are relatively new. In the most recent update of Federal Climate Adaptation Plans, agencies responded to a common set of indicators and process metrics, to improve assessment and communication of climate resilience efforts across the Federal Government. For international-facing climate adaptation and resilience activities, the Federal Government is periodically reporting on progress within the framework of the President's Emergency Plan for Adaptation and Resilience (PREPARE) initiative. At the state level, states like Washington, Massachusetts, and California, are developing and implementing systems of metrics to monitor implementation of adaptation actions.[139]

The U.S. Government also maintains a variety of systems to track and monitor Federal government spending, including USASpending.gov,[140] SAM.gov,[141] the Federal Audit Clearing House,[142] the GAO,[143] and Grants.gov.[144] When Federal funding for contracts is awarded, robust systems are typically in place to track and monitor implementation to confirm that agreed-upon work has been completed. *(Target 10(d))*

Achievements, impacts, resilience, review, effectiveness and results

Over the past few years, transformative funding has been awarded for resilience and adaptation projects across the country—much of it through the BIL and IRA. Many of these projects are collected and highlighted on Federal websites such as Invest.gov,[145] Cleanenergy.gov,[146] and Conservation.gov.[147] Proposed and final regulations are generally tracked and published on www.regulations.gov. Individual agencies also typically announce major grants, loans, policies, and publications on their websites. *(Target 10(d))*

In 2023, FEMA announced 656 project selections for $1 billion in climate adaptation and resilience funding.[148] The top three funded project types are:

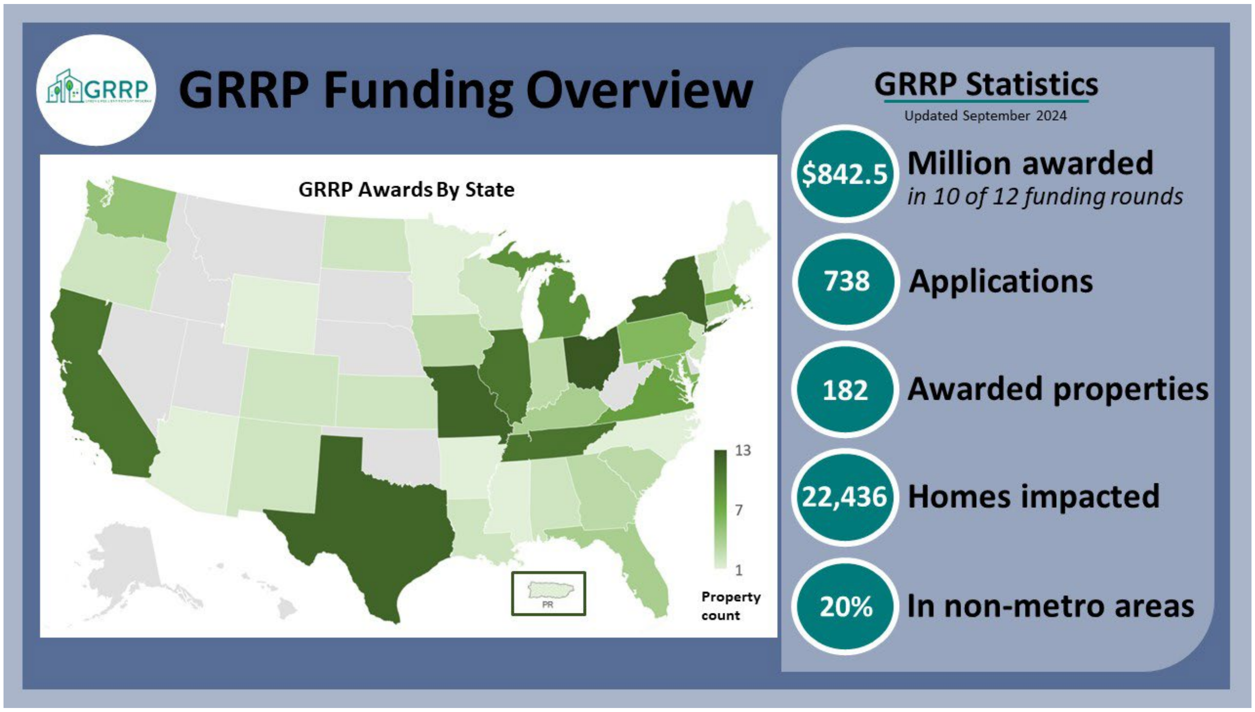
- Flood control for $395 million across 28 projects, designed to eliminate or reduce flood damage;

- Utility and infrastructure protection for $237 million across 30 projects, like elevating pumping stations, enhancing power poles, strengthening water towers and floodproofing utility plants;
- Building code-related projects for $55 million across 129 projects for enforcement and adoption of more modern, hazard-resistant building codes. This is the greatest number of projects FEMA has ever selected for building code-related activities in a grant cycle. These funds were reserved as a non-competitive set-aside for states, Tribes and territories, resulting in a 180 percent increase in requests for adoption and enforcement funding.

Below is a sample of projects that increase the resilience of communities across the United States *(Targets 10(c) and 10(d))*. More examples of the achievements, impacts, results, effectiveness can be found in Section C: Domestic priorities.

- The Eastwick Near-Term Flood Barrier Project, led by the Philadelphia Office of Sustainability and funded by FEMA with over $2 million, will construct barriers to reduce flooding.[149]
- A FEMA-funded project in Washington, D.C. will install 20 shaded bus shelters in Washington, D.C. to mitigate the effects of extreme heat.
- Safety net health care providers are leveraging Inflation Reduction Act tax credits to invest in renewable energy, energy storage technologies, and charging stations, resulting in building resilience and community benefits (e.g., sharing of solar energy credits, free charging stations).[150]
- A blend of NBS and infrastructure improvements will boost flood resilience along the Big Ditch stream corridor in the city of Goldsboro, North Carolina. The FEMA-funded project will upgrade road culverts and expand a restored floodplain. This will make homes safer from flooding as well as improve water quality and provide new wildlife habitat and more equitable access to recreational resources.[151]
- NOAA's Climate Resilience Regional Challenge grant program awarded $575 million in funding for 19 projects that will invest in holistic, collaborative approaches to coastal resilience at regional scales. Funds will support climate resilience and adaptation actions that are appropriate to the plan, place, and people, and supported by NOAA technical assistance.[152]
- HUD's Green and Resilient Retrofit Program (GRRP)[153] has awarded $842.5 million in funding and up to $4 billion in loan authority from the IRA to provide funding to properties with the highest need for climate resilience and utility efficiency upgrades. Figure 4-4 details GRRP's funding status.

Figure 4-4: HUD's GRRP Funding Status Map



Source: HUD[154]

Approaches and systems used, and their outputs

In the United States, climate resilience and adaptation policy are a whole-of-government, agency-wide risk management activity.[155] Following legislation by Congress, policymaking takes place within agencies to implement and enforce laws, including through agency notice-and-comment rulemaking with opportunities for public input. The White House coordinates, oversees, sets priorities, and facilitates partnerships in collaboration with Federal agencies, including through EOs and interagency working groups. Unified approaches to climate resilience and adaptation policy (and relevant pieces thereof) are set forth in a variety of keystone documents, including the National Climate Resilience Framework.[156]

As per the National Climate Resilience Framework, the Federal Government uses the following principles to guide activities and investments to strengthen climate resilience at all levels.

- **Proactive**. Implement solutions that anticipate and address climate threats and impacts before damages occur. Prioritize activities and investments through risk-based approaches, including approaches that account for complex risks, like cascading impacts and concurrent events, as well as approaches that account for differences in vulnerability and response capabilities within and across communities.
- **Whole-System**. Consider the ways in which communities and natural systems are interconnected, including recognizing that risks and impacts from climate change are borderless. Strive both to leverage synergies (e.g., when increased resilience of one

community contributes to the resilience of others) and to avoid maladaptive activities (e.g., when efforts to increase resilience in one community impose harms on another).

- **Equitable and Just**. Pursue solutions that address, and do not exacerbate, disparities between and within communities. Ensure that strategies respond to the needs of underserved and marginalized communities that have historically borne a disproportionate share of climate impacts and costs.
- **People-Centered**. Position the well-being of individuals, families, communities, and society at the center of goals and solutions. Consider the needs and perspectives of all community members, including those that are most vulnerable and have been historically marginalized or disadvantaged.
- **Collaborative and Inclusive**. Work across sectors to identify and pursue shared goals. Create pathways for all community members to be meaningfully involved in decision-making, and conduct active outreach to raise awareness of these pathways and address barriers to participation.
- **Durable**. Implement solutions that serve current and future needs. Ensure that there is continuity of technical expertise and leadership as needed, including by enhancing or building community capacity to sustain and adapt solutions for the long term.\

How adaptation increased resilience and reduced impacts

As noted in NCA5, systematically developing, measuring and tracking metrics for climate resilience investments is challenging. However, as the Climate Resilience Game Changers Assessment[157] describes, non-governmental research consistently indicates that adaptation investments return benefits several times greater than the initial investments—including research from the National Institute for Building Sciences,[158] the U.S. Chamber of Commerce,[159] and the Boston Consulting Group.[160]

Federal work continues to develop metrics to track the benefits of adaptation actions to long-term resilience and in reduced impacts. As noted in NCA4, the U.S. Department of Housing and Urban Development's 2014 National Disaster Resilience Competition required applications to conduct benefit–cost analysis including qualitative and difficult-to-quantify co-benefits, such as economic revitalization and other social benefits.[161]

When adaptation is not sufficient to avert impacts

Through reports such as the NCA5, and experiences of communities who have experienced the impacts of extreme weather events, it is understood that not all adaptation efforts have been sufficient to avert impacts. To date, adaptation across the United States has been incremental in nature, and given the expected future pace of climate change, more action is needed at greater rates and larger scales, across more sectors, and in context-specific ways. Future adaptation practices may require not only more adaptation efforts (more actions, scaled up, across a wider range of actors, sectors, and systems) but also more transformative adaptation: actions that involve persistent, novel, in-depth changes that shift the fundamental traits of institutions, behaviors, values, or technologies across multiple sectors and scales.

There is also a need and opportunity to better center equity in adaptation planning and actions and to use a systems-oriented, regional, or collaborative approach for transformation. As acute and chronic climate impacts increase, adaptation efforts are rapidly progressing in terms of attention, investment, financing, and monitoring. The United States is also working to enhance the resilience of communities through recovery and rebuilding processes when damages occur from extreme weather events, to minimize future damages and risks.[162]

How effective implemented adaptation measures are

This topic is covered in Section F: How adaptation increased resilience and reduced impacts.

Transparency of planning and implementation

Planning

Federal agencies are required to periodically publish CAPs and report on their progress (further information can be found in Section C: Domestic priorities).

Implementation

Implementation updates from the BIL and IRA are tracked across a wide range of Federal government websites, listed in Section F: Establishment or use of domestic systems. Several executive branch agencies, components, and programs, such as the U.S. Climate Resilience Toolkit, also maintain internal tracking mechanisms for Federal investments, regulations, programs, and policies relevant to implementation of resilience funding. These include BIL and IRA funding and project trackers and reporting.[163,164,165] A number of private sector and non-governmental organizations also track government spending and implementation progress, particularly with respect to Federal funding and programs from the BIL and IRA. This includes the IRA Tracker,[166] Climate Wins Here map,[167] and other project trackers.[168,169,170] Several states and local governments also maintain public tracking mechanisms for their own resilience actions, such as the Commonwealth of Massachusetts[171] and the City of San Diego.[172]

How support programmes meet specific vulnerabilities and adaptation needs

To protect all communities in harm's way, the United States has placed environmental and economic justice at the center of its climate resilience agenda.

A good example of this is the Justice40 Initiative. For the first time in U.S. history, the Federal Government has made it a goal that 40 percent of the overall benefits of certain Federal climate, clean energy, affordable, and sustainable housing, and other investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution. Categories of investment include climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure. As reported on Phase Two of the Environmental Justice Scorecard, through the Investing in America agenda and other sources, the United State has allocated approximately $613 billion in funds from Fiscal Years 2022-2027 for programs that are part of the Justice40 Initiative.

In order to track progress, all Federal agencies are required to identify and transform their programs covered under the Justice40 Initiative. In January 2023, additional guidance to Federal agencies was released on how to use the Climate and Economic Justice Screening Tool, which is a mapping tool that helps identify disadvantaged communities. All Justice40-covered programs are required to engage in stakeholder consultation and ensure opportunities for local community members to be meaningfully involved in determining program benefits.[173]

The Ocean Justice Strategy provides a framework to fully integrate environmental justice principles into Federal ocean activities, including ocean climate activities. The Strategy was motivated by the recognition that many communities that live near the ocean, depend on marine resources, or are part of the ocean economy face unique circumstances that exacerbate their existing challenges and prevent equitable access to the benefits the ocean provides.

Other examples, such as EO 14096, can be found in Section A: Legal and policy frameworks.

How adaptation actions influence other development goals

Examples of implementation on how adaptation actions influence other development goals can be found in Section C: Domestic priorities.

Good practices, experience and lessons learned from policy and regulatory changes, actions and coordination mechanisms

The National Climate Resilience Framework articulates the following best practices and lessons learned, derived from interagency consultation and experience.

The U.S. Government will and must serve as an active, flexible, coordinated, and committed partner with these entities in helping design and implement resilience strategies that meet the vision and needs of every community. In order to serve in this partner role, the Federal Government will need to have a continued focus on reforming and modernizing Federal programs and policies in ways that strengthen climate resilience – for example, embedding environmental justice into the DNA of Federal departments and agencies, or doubling down on making science, resources, and technologies accessible to everyone. The U.S. Government must also center effective Tribal consultation, respect for sacred sites, and recognition of Tribal sovereignty as important components of climate resilience planning and hazard response.[174]

Ownership, stakeholder engagement, alignment of adaptation actions with national and subnational policies, and replicability

The United States prioritizes stakeholder engagement, as demonstrated through examples in Section D: How best available science and Section C: Domestic priorities. However, the ability of individuals and institutions to engage in adaptation is affected by their access to resources, which is unevenly distributed and mediated by factors such as income, race, ethnicity, and gender. Federal or state resources for adaptation are often available to individuals, communities, and Tribes only if they navigate bureaucratic systems or success in competitions. Rural or less populous towns, for example, may have fewer professionals to dedicate time to grant applications, fewer resources to meet Federal cost-share requirements, or difficulty in proving that adaptation would be effective. To address this challenge, Federal agencies have been providing technical assistance to potential applicants. An example is EPA's Community Change Grants Equitable Resilience Technical Assistance, which offered free design assistance, community engagement, and partnership development workshops to develop shovel-ready climate resilience projects and supportive coalitions eligible for Community Change Grant funding. Alignment of national and subnational policies is noted in Section D: Stakeholder involvement.

The United States seeks to enhance replicability by providing standardized, authoritative sources of information to inform adaptation (see, for example CMRA, NCA Atlas, U.S. Sea Level Change[175]); by capturing case studies (see NCA5); and through ongoing efforts to include forward-looking climate information into Federal decision-making processes (see FFRMS-CISA).

The results of adaptation actions and the sustainability of those results

Assessments of the effectiveness of adaptation actions have generally been limited to project-specific performance against a limited set of extreme events or climate conditions. Adaptation researchers and practitioners have begun to track the number of actions that have occurred across the United States and to evaluate adaptation projects in a limited manner. However, efforts to assess trade-offs, effectiveness, sufficiency, and long-term consequences of incremental and transformative adaptation actions are still largely theoretical and will need more work to implement and consistently track over time. Metrics will need to be granular enough to observe disparities among communities to reduce potential inequities. One challenge is that implementation of adaptation actions typically occurs at the local, place-based level and is often embedded in other efforts, versus being standalone, and across a diversity of sectors (e.g. infrastructure design and implementation, land and water management). The wide diversity of potential adaptation actions also means a wide diversity of potential desired outcomes and co-benefits. This complexity makes it difficult to develop standardized metrics that can be tracked at the national scale, while providing useful information and insights. *(Target 10(d))*

The sustainability of actions taken today to enhance adaptation will best be evaluated in the long-term. Sustainability is a key consideration in the design, selection, and funding of Federal adaptation actions and programs.

Cooperation, Good Practices, Experience, and Lessons Learned

As the United States reduces and manages the impacts of climate change domestically, it is also committed to enhancing international cooperation on adaptation and supporting vulnerable countries. Launched in 2021, PREPARE unites the diplomatic, development, and technical expertise of the U.S. Federal Government with a goal of helping more than half a billion people in vulnerable developing countries adapt to and manage the impacts of climate change by 2030. Through PREPARE, the United States works with international partners to advance progress on the global goal on adaptation, helping countries and communities to enhance adaptive capacity, strengthen resilience, and reduce vulnerability and contribute to the targets in the UAE Framework for Global Climate Resilience. PREPARE supports efforts to share information, good practices, experience and lessons learned across three pillars: PREPARE Knowledge, PREPARE Plans and Programs, and PREPARE Resources.

The following sections include illustrative examples of how the United States, across multiple Federal departments and agencies, is supporting developing countries with adaptation planning and implementation. Paragraphs from the modalities, procedures, and guidelines (Decision 18/CMA.1) are denoted.

PREPARE Knowledge – Supporting scientific research and knowledge, improving climate information services, including early warning systems, and promoting science-informed policy relevant to adaptation: Through PREPARE, the United States is strengthening climate information services and early warning systems in over 80 countries to equip people and institutions with information to identify and implement the plans, policies, and actions needed to effectively adapt to climate change. Under PREPARE, the U.S. government is supporting climate information services chains in vulnerable countries. This includes support for weather and climate observation and data collection, the development and delivery of climate information services, and technical training for partners to enhance their ability to provide and use climate information services to improve decision making.

- **Observations and Data Collection (para. 116(a)(i) and para. 116(b)(i-iii)):** Through PREPARE, since 2022, the United States has joined 12 other donors to support over 60 climate-vulnerable countries through the Systematic Observations Finance Facility (SOFF), which aims to close existing weather and climate observation gaps. SOFF provides funding to install, rehabilitate, and maintain observation infrastructure and to develop human and institutional capacity for weather and climate observation; this is critical for improving weather forecasts, early warning systems, and climate information services. (Target 10a)
- **Development and Delivery (para. 116(a)(i) and para. 116(b)(i-iii)):** The U.S. government supports the co-development and delivery of climate information services through PREPARE. USAID's Famine Early Warning Systems Network (FEWS NET) delivers long-lead early warning of climate emergencies, including the unprecedented five-season 2020-2022 drought in the eastern Horn of Africa, ensuring that national governments and aid agencies plan for and deploy timely humanitarian assistance. FEWS NET also uses climate information services to inform its early warning information and analysis of current and future acute food insecurity. In 2024, FEWS NET launched an Interactive Heat Exposure Projections Map to help policy makers, donors, and other stakeholders better understand and plan for extreme heat. Decision-makers can identify a population's extreme heat exposure as experienced in the recent past and projected to 2050 to understand the evolution and scale of extreme heat threats. (Target 9b, 10a)

- **Training and Capacity Strengthening (para. 116(a)(i) and para. 116(b)(i-iii)):** PREPARE strengthens the capacity of governments and institutions to implement and utilize climate information services. For example, in July 2024, the State Department and NOAA kicked off new support for the Pacific Islands through a multi-hazard climate forecasting and early warning training workshop for forecasters from nine Pacific countries. Immediately after the forecaster training, NOAA piloted a Climate Early Warning Stakeholders workshop for the Meteorological Services of Fiji, Kiribati, and the Solomon Islands. The workshop focused on tracking the impacts of climate change and seasonal weather patterns, such as the El Niño Southern Oscillation, on prolonged droughts and excessive rainfall across the Pacific Islands, and integrating these forecasts into outlook bulletins for stakeholders. Workshops like these help communities and decision makers effectively prepare for climate impacts, reduce losses, and save lives.

PREPARE – Plans & Programs: Supporting policy innovation, integration of adaptation at different levels, improving the durability and effectiveness of adaptation actions, enhancing monitoring, learning and evaluation of adaptation actions: Pillar 2 of PREPARE aims to partner with vulnerable countries and communities to plan for climate impacts and mainstream adaptation into broader decision making that protects lives, livelihoods, and the natural environment from the impacts of climate change. Pillar 2 includes focused action in infrastructure, food security, water, and health.

- **Integration of adaptation into planning at different levels (para. 116(a)(iii)):** USAID, through its Comprehensive Action for Climate Change Initiative (CACCI), is helping over 17 countries and three regional entities to develop strong nationally determined contributions and national adaptation plans (NAPs) that integrate climate considerations with development and economic growth objectives. USAID Guatemala, in the Western Highlands, worked with Rafael Landivar University and local water user associations to create 11 sustainable watershed management plans which unlocked public financing to preserve 2,300 hectares of forest land critical for farmers and people downstream. The State Department supports the NAP Global Network, which builds capacity in least developed and developing country governments to understand their country's climate risks and make decisions to protect their key development sectors from climate change through national adaptation planning. With U.S. funding, NAP Global Network has provided technical assistance to 24 countries for national adaptation planning processes since 2021. For example, in 2023, NAP Global Network supported the development of water sector indicators, analysis procedures, and developing reports for Vietnam's NAP monitoring and evaluation system. In addition, NAP Global Network supports sustained peer learning and exchange on NAP planning and action, including the launch of a new peer-learning cohort in Central America to build a community of practice to address shared adaptation priorities and challenges.

- **Promoting effective adaptation by helping developing countries identify adaptation practices, needs, priorities, and challenges and gaps (para. 116(a)(vii)):** The State Department is strengthening the capacity of leaders, decision makers, and practitioners to implement effective adaptation and resilience strategies through programs like the Resilience and Adaptation Mainstreaming Program (RAMP). Implemented by the World Resources Institute and University of London's School of Oriental and African Studies, RAMP partners with local universities to build the capacity of ministries of finance to integrate adaptation into national level budgets, plans and processes. Since it was launched in 2022, RAMP has worked with local universities to develop 12 core curricula and, in February 2024, trained 93 faculty of economics and finance to deliver these courses. Working with faculty, RAMP is delivering country-tailored workshops for ministries of finance. In July 2024, it held in-depth training for 35 government officials in Uganda to strengthen fundamental skills such as analyzing economic and financial impacts of climate change, conducting cost benefit analyses for adaptation investments, and integrating climate change into national planning and budgeting processes. RAMP is currently being implemented in eight pilot countries across Africa. PREPARE is also working to elevate locally led approaches to adaptation. USAID endorsed the Principles for Locally Led Adaptation at COP26 and is implementing this work in line with the Localization Approach and Local Capacity Strengthening Policy. The State Department is supporting the Least Developed Countries (LDCs) Initiative for Effective Adaptation and Resilience (LIFE-AR), which is an LDC-led initiative intended to achieve a low-carbon, climate resilient future by focusing on locally led adaptation efforts in LDCs. Through LIFE-AR, LDC front-runner countries are integrating climate resilience and adaptation into national and local development objectives; developing strong climate finance architecture to ensure that at least 70 percent of finance supports locally led climate action by 2030; and building capacity and strengthening governance to develop more effective and inclusive climate decisions.
- **Policy Innovation (para. 116(a)(ii)):** In 2022, the United States announced a policy stating that the United States will not challenge maritime zones and baselines that have been established consistent with international law and that are not subsequently updated despite sea-level rise caused by climate change. For the many countries that derive substantial income from the resources found within their exclusive economic zone, this policy helps preserve access to critical sources of revenue. In support of this policy, the United States is exploring opportunities to collaborate with countries and regional organizations to support their efforts to determine and publish their coastal baselines.
- **Improving the durability and effectiveness of adaptation action, including monitoring, evaluation, and learning (MEL) (para. 116(a)(vi)):** With U.S. support, the NAP Global Network most recently supported Vietnam and Namibia with enhancing their MEL systems. Responding to a request from the Vietnamese government, the NAP Global

Network provided support in the development of a set of indicators for the M&E system for the NAP in the Water sector combining top-down and bottom- up approaches, and developing the procedures for analyzing databases, applying indicators, developing the M&E report for the water sector at local and national levels. Similarly, in Namibia, the NAP Global Network is supporting the government to establish an adaptation MEL system, focusing on building on the adaptation priorities identified in Namibia's adaptation communication and revised nationally determined contribution.

PREPARE – Resources: Supporting pilot and demonstration projects, innovating types of cooperation, in different areas and at different scales: Pillar 3 of PREPARE aims to accelerate financing of adaptation measures by strengthening capacity of partner countries to access finance for adaptation, developing bankable investments, promoting innovation, mobilizing private sector capital, and supporting the development of climate risk finance strategies.

- **Supporting pilots and demonstration projects (para 116(a)(ii)):** Small and medium sized enterprises are critical to a thriving economy and play an important role in innovating adaptation solutions. But often, these technologies are only available or tested in developed economies, and not the communities that most need access to them. To accelerate technology transfer, the State Department is funding a technical assistance facility under the Climate Resilience and Adaptation Finance & Technology (CRAFT) fund, a first-of-its-kind growth equity climate resilience-focused fund. Through this facility, PREPARE has supported the deployment of a new hydropanel technology that produces clean drinking water from sunlight and air. Working in partnership with the Ministry of Education in Vanuatu and a utility company in Tonga, CRAFT's TA Facility is helping pilot a pay-per-liter local service in freshwater-scarce communities that are increasingly relying on imported drinking water.
- **Cooperating across different scales (para 116(a)(iii-iv)):** The United States has helped the African Union's flagship Africa Adaptation Initiative (AAI) to launch the AAI Food Security Accelerator, which is designed to dramatically speed-up and scale-up private sector investments in climate resilient food security in Africa. With U.S. support, the Accelerator is helping to identify, structure and de-risk a pipeline of transformative adaptation investments in innovative food security solutions, ranging from cold storage logistics to post harvesting processes, all while building the capacity of African-owned small and medium sized enterprises.
- **Promoting innovative approaches to adaptation (para 116(a)(v)):** To promote the incubation and development of innovative financing instruments to drive investment to adaptation, the State Department created the inaugural adaptation window in the Global Innovation Lab three years ago. Most recently, the lab helped develop a women-led investment fund in Mexico that is creating a project pipeline for the regeneration of Mexican ecosystems. Funding supports NBS implementation by rural companies and a

blended-finance facility targeting urban food markets in Africa to reduce food waste and improve food delivery.

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U.S. Biennial Transparency Report

Chapter 5:
Supporting the Global Community

Chapter 5: Supporting the Global Community

A. National Circumstances and Institutional Arrangements

Introduction

This sub-section addresses paragraph 119c of the Modalities, procedures and guidelines (MPGs) for the transparency framework for action and support referred to in Article 13 of the Paris Agreement (18/CMA.1).

Tackling the climate crisis is a central priority for U.S. foreign policy and national security, and the United States is committed to leading efforts to mobilize resources for developing countries in their efforts to mitigate and adapt to climate change. This commitment is reflected in the January 2021 Executive Order on Tackling the Climate Crisis at Home and Abroad, the April 2021 U.S. International Climate Finance Plan, the March 2022 U.S. Department of State-U.S. Agency for International Development (USAID) Joint Strategic Plan, the July 2022 USAID Climate Strategy 2022-2030, the October 2022 U.S. National Security Strategy, and many other U.S. government strategies and initiatives.

Climate finance, technology development and transfer, and capacity building are fundamental to these efforts. The United States has undertaken a whole-of-government effort and partnered with a wide range of institutions to scale up financial flows for climate action, mobilize public and private finance, and invest strategically in a sustainable future. This includes helping communities anticipate, prepare for, and manage climate change impacts; establishing the enabling conditions for climate-resilient, low-emissions development; reducing land-based emissions through conservation, sustainable management, and restoration; supporting the transition to clean energy; facilitating the establishment of high-integrity carbon markets; supporting partner countries to establish and achieve ambitious nationally determined contribution (NDC) targets; and mobilizing public and private climate finance. The United States is working to ensure that its capacity-building and investment support is efficient, effective, innovative, based on country-owned plans and strategies, and focused on achieving measurable results with a long-term view toward economic prosperity.

As a demonstration of this commitment, the United States pledged in 2021 to work with Congress to scale up U.S. international public climate finance to developing countries four-fold to over $11 billion per year by 2024, including a six-fold increase in adaptation finance to $3 billion per year as part of the President's Emergency Plan for Adaptation and Resilience (PREPARE). In 2021 and 2022, the United States made significant progress toward delivering on this historic pledge, and President Biden subsequently announced that the United States successfully delivered over $11 billion in international public climate finance in 2024.[1] The United States also remains committed to working with other developed countries to collectively mobilize $100 billion per year in climate finance and welcomes that this goal was fully met for the first time in 2022.

Efforts to Enhance Transparency

This sub-section addresses elements of paragraphs 119a, 119b, and 119d of the MPGs.

This chapter provides information on U.S. climate finance by channels and instruments, thematic pillar, and region; describes U.S. efforts to mobilize private climate finance; and illustrates examples of U.S. support for the development and deployment of technology and capacity building in developing countries. The United States views transparent tracking and reporting of climate finance as key to ensuring accountability, promoting effectiveness, and building trust. To ensure robust reporting, each implementing government agency or entity follows established guidelines and eligibility criteria for collecting information on support for climate-related activities.

To enhance comparability and accuracy of climate finance information, the United States engages with other climate finance contributors directly, sharing best practices, building methodologies for accounting for innovative financial instruments, and exchanging lessons learned for overcoming barriers and improving the robustness of reporting. The United States is also engaged in the work of the Organization for Economic Co-operation and Development (OECD), which is the authoritative source for tracking progress toward the collective goal of developed countries to jointly mobilize $100 billion per year, in the context of meaningful mitigation actions and transparency on implementation. The OECD's work is based on a robust and transparent accounting methodology and designed to promote accuracy and in particular to assure the avoidance of double counting.

This first biennial transparency report (BTR) of the United States is the first instance of U.S. reporting under the Paris Agreement on financial support mobilized through public interventions. For the purpose of the BTR, the United States has provided information on the amount of *private* climate finance mobilized for supporting climate change mitigation and/or adaptation in a developing country as a result of U.S. government assistance, whether financial or non-financial. This is consistent with climate finance mobilized as it is referred to in the context of the goal of developed countries to jointly mobilize 100 billion, from a wide variety of sources, public and private, bilateral and multilateral, including innovative sources.[1] In order to accurately report on private climate finance mobilized in this BTR, the United States has developed the above definition of private climate finance mobilized, alongside clear internal reporting and accounting guidelines. Nevertheless, challenges remain in gathering and reporting comprehensive data on private climate finance mobilized, as detailed below.

Building Effective Enabling Environments

This sub-section addresses elements of paragraph 119c of the MPGs.

The United States recognizes the critical role that partner countries play in promoting the effectiveness of climate finance. Where partners set in place systems that reflect high standards of transparency, good governance, and accountability, climate finance contributors and investors are better able to respond directly to country priorities, in line with established national strategies and country development plans based on broad participation and consultation. This in turn empowers partner governments to drive development and sustain outcomes by working through national institutions.

Experience has shown that the ability of any public financial instrument or intervention to mobilize and deploy additional finance in a given country depends on the domestic policy framework in place. This can involve climate-specific policies, such as energy sector regulations, as well as broader, non-climate-specific policies and legal frameworks. The United States remains committed to working with its development partners to identify complementary solutions to address domestic investment barriers and implement their low-carbon, climate-resilient development strategies. Examples include:

- **First Movers Coalition:** The First Movers Coalition (FMC) is an initiative to build private sector demand for emerging clean energy technologies that are not yet commercially viable but are needed to decarbonize hard-to-abate sectors and reach global net-zero emissions. The FMC was launched as a platform for private companies to make purchasing commitments to create the early markets for emerging technologies across

[1] 1/CP.16 paragraphs 98-99

eight key sectors: shipping, trucking, aviation, steel, aluminum, cement/concrete, and carbon dioxide removal. The FMC includes 99 members who have made more than 125 purchasing commitments across these sectors, representing an annual demand of around $16 billion.

- **Association of Southeast Asian Nations (ASEAN) Future Forest Economy:** Under the ASEAN Future Forest Economy program, the United States is promoting efforts to institutionalize sustainable forest management practices and policies to reduce deforestation and improve enabling environments to mobilize significant capital investment across the region toward sustainable forestry, forest restoration, and responsible land use. The program will enhance the capacity of key partner countries in the ASEAN region, such as Vietnam, Thailand, and Indonesia, to plan, implement, and monitor best technical and policy practices targeted toward delivering emissions reductions in line with their NDC targets, as well as the development of roadmaps for low carbon growth strategies that are targeted toward sustainable use of countries' forest resources.
- **Natural Infrastructure for Water Security:** The Natural Infrastructure for Water Security (NIWS) project works in partnership with natural infrastructure investors including regional governments, water utilities, national agencies, and private companies to mobilize investments in natural water infrastructure. NIWS is growing a portfolio of public and private investments in natural infrastructure to implementation while strengthening implementers' capacities to develop and manage these activities. NIWS also works with national and subnational authorities, project developers and implementers, local communities, universities, and civil society to strengthen the governance and enabling environment for natural infrastructure investments.

Technology & Capacity Building

This sub-section addresses elements of paragraph 120 of the MPGs.

The United States has a long history of global leadership on technology development and transfer. For example, Silicon Valley, California may be the most well-known example of an innovation hub, where researchers and entrepreneurs have developed many of the most significant advances in the information and communication technology sector. Part of the key to this technology innovation leadership lies in the supportive policy enabling environment and the central roles of government, the private sector, and research and academic institutions. Similar innovation ecosystems exist in other metropolitan areas, including New York City and Boston.

The U.S. innovation ecosystem receives fundamental support from Federal and state governments. U.S. government agencies work with state and local governments, academia, and the private sector to promote research, development, demonstration, and deployment of technologies that support climate action through modeling and analysis, decarbonization and emission mitigation, adaptation and resilience. The United States promotes international cooperation with developing countries in support of climate-related technology development and transfer through a whole-of-government effort that supports endogenous capacities, strengthens domestic enabling environments, catalyzes investment, and addresses the full range of the technology adoption life cycle. Drawing on this culture of innovation, U.S.-based businesses play a significant role in international markets related to climate technology, both in terms of emerging and mature technologies.

During the reporting period, the United States enacted three historic laws that are making a substantial contribution to enhancing the domestic and international deployment of climate-friendly technologies: the Bipartisan Infrastructure Law (BIL), the Inflation Reduction Act (IRA), and the CHIPS Act. The implementation of this legislation is expected to have a profound effect on the costs of climate-friendly technologies around the world, increasing their accessibility for all. The Department of the Treasury estimates that "[t]he IRA will yield cumulative global economic benefits from reduced greenhouse gas (GHG) pollution of over $5 trillion from the present to 2050."[2]

Similarly, the United States has a long history of providing capacity building support through USAID and other U.S. technical agencies, strengthening the capacity of national governments, regional institutions and civil society organizations to build resilience to the negative effects of climate change.

Through targeted projects and programs that incorporate capacity building into its design, the United States encourages country-driven capacity building that responds to national needs and builds country ownership.

B. Underlying Assumptions, Definitions, and Methodologies

Overview of U.S. Climate Finance FY 2021-2022

Introduction

This sub-section addresses elements of paragraphs 121a, b, c, d, e, l, and s of the MPGs.

The United States provided over $7.3 billion in climate finance in Fiscal Years (FY) 2021-2022, increasing its provision from $1.5 billion in FY 2021 to $5.8 billion in FY 2022.[2] These figures include U.S. bilateral finance and contributions to multilateral climate funds. In addition, the United States mobilized a further $10.7 billion in private finance in FY 2021-2022.

The efforts of the United States, alongside other contributors, were critical to fully delivering on the collective goal to mobilize $100 billion per year in climate finance, which was fully met and exceeded for the first time in 2022, with a collective $115.9 billion mobilized according to the OECD.

Consistent with the reporting guidance of the Paris Agreement's enhanced transparency framework, the data and examples in this chapter focus on programs funded in FY 2021-2022 (October 1, 2020–September 30, 2022). All reporting is in U.S. dollars and reflects finance that has been committed. U.S. climate finance is disbursed through bilateral, regional, and multilateral channels and comprises both official development assistance (ODA) as well other official flows (OOF).

For the purpose of climate finance reporting under the Paris Agreement, the United States only includes programs that have mitigation and/or adaptation as a primary objective, or as an intentional, significant co-benefit (e.g., for relevant biodiversity and food security activities). In the case of programs for which only part of the activity is targeted toward a climate objective, only the relevant portion of financial support is counted, rather than the entire program budget. Climate finance information is vetted at the subcomponent level by expert reviewers in dialogue with the reporting departments and agencies before inclusion in official U.S. climate finance reporting.

U.S. finance can be explored across a number of dimensions, including the institutional channels through which it is delivered, the financial instruments used, the geographies targeted, and its ultimate end use in terms of building resilience, reducing emissions, or conserving, restoring, and sustainably managing land.

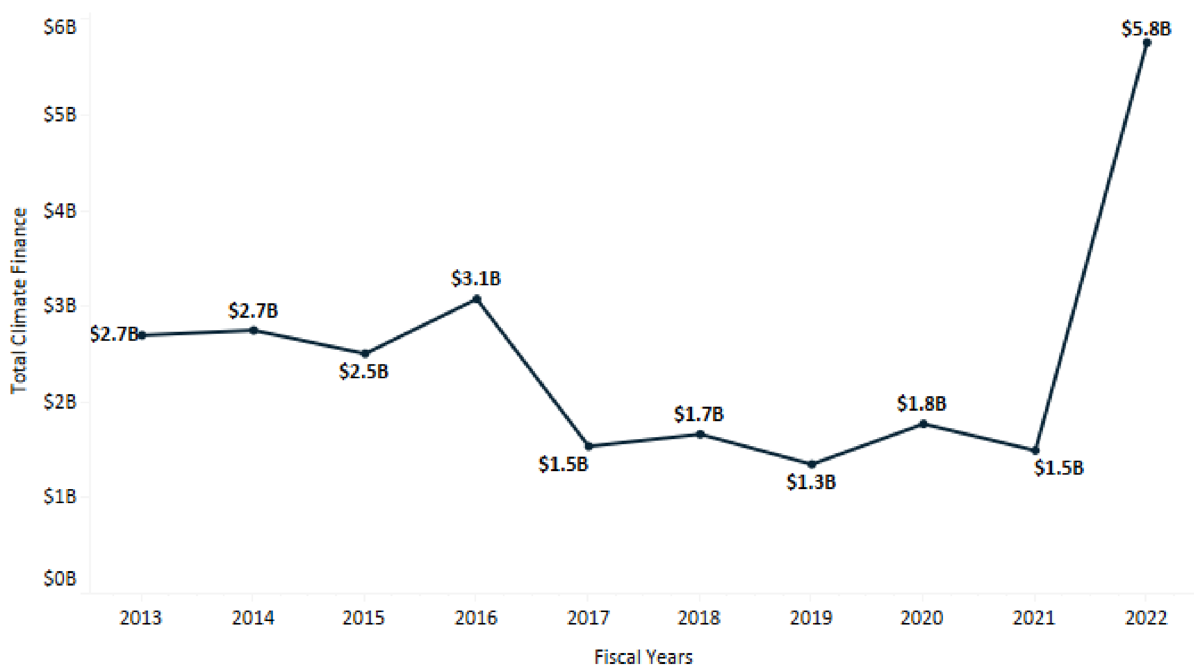
New & Additional Finance

This sub-section addresses elements of paragraph 121r of the MPGs.

[2] Figures throughout this chapter may not sum due to rounding.

Scaling up international assistance for climate change is a significant priority for the United States. The U.S. Congress appropriates new and additional funding to support international climate efforts on an annual basis, in response to the President's budget request. This funding supports programs to advance adaptation, clean energy, and sustainable landscapes efforts internationally. It also underpins efforts by U.S. agencies to incorporate climate change into their programming. Since ratifying the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, U.S. international climate finance increased from virtually zero in 1992 to $5.8 billion in 2022 (see Figure 5-1).

Figure 5-1: Total Climate Finance Provided Per Year, FY 2013-2022



Channels

This sub-section addresses elements of paragraphs 121d and 121e, and of the MPGs.

The United States provides climate finance through both bilateral and multilateral channels.

Bilateral

From FY 2021-2022, the United States committed $5.9 billion in bilateral climate finance to its developing country partners. This finance was provided in one of three forms:

Congressionally appropriated—This finance is appropriated on an annual basis as part of the official development assistance of the United States. This assistance amounted to approximately $2.9 billion from FY 2021-2022 through bilateral channels.

Development finance—The United States is one of the world's largest financiers of clean energy projects in developing countries, committing approximately $2.8 billion from FY 2021-2022 in other official flows. In addition to standard lending, the United States provides senior secured loans to private equity funds—making it one of the largest supporters of private equity funds in developing countries—and political risk insurance to project lenders and equity investors operating in emerging markets.

Export credit—From FY 2021-2022, the United States committed $212 million of export credit financing to support climate-specific activities in developing countries.

Multilateral

Multilateral climate change funds—These entities feature institutional structures governed jointly by governments. They play an important role in promoting a coordinated, global response to climate change. From FY 2021-2022, the United States committed approximately $1.4 billion to multilateral climate change funds. This includes over $246 million in funding for climate funds under the Global Environment Facility (GEF) and a $952 million concessional loan to the Clean Technology Fund.

Multilateral development banks (MDBs)—U.S. contributions to the MDBs, as well as those from other development partners, play a key role in enabling these institutions to provide billions in climate support to developing countries. From 2021-2022, the MDBs committed more than $112 billion in total climate finance for low- and middle-income economies. However, since countries' contributions to MDBs are not earmarked for specific purposes, it is not possible to specify the exact proportion of U.S. support that ultimately finances climate change activities in developing countries. Thus, U.S. contributions to the ordinary capital resources of the MDBs are not included in figures presented in this chapter. Although we do not include it here, MDB financing for climate activities is included in the $100 billion climate finance goal according to the methodology developed by the OECD.

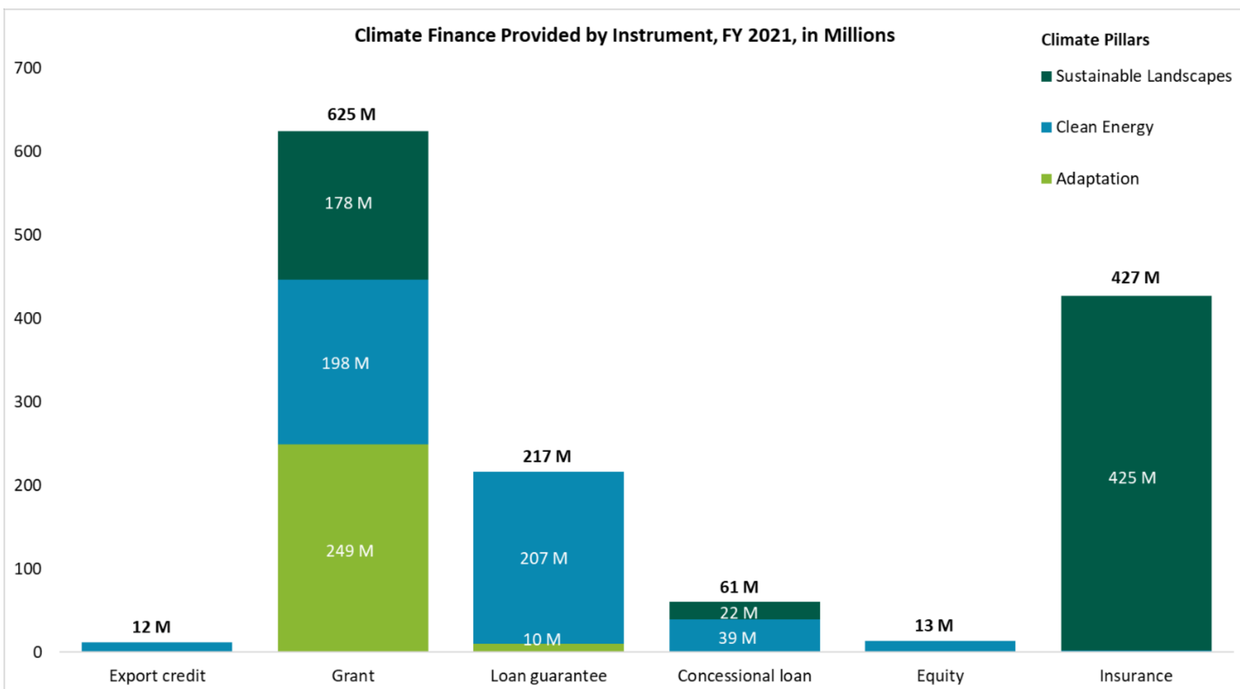
Annex 4 contains detailed information on the methodology employed to report on U.S. international finance. Annex 5 details U.S. public support provided.

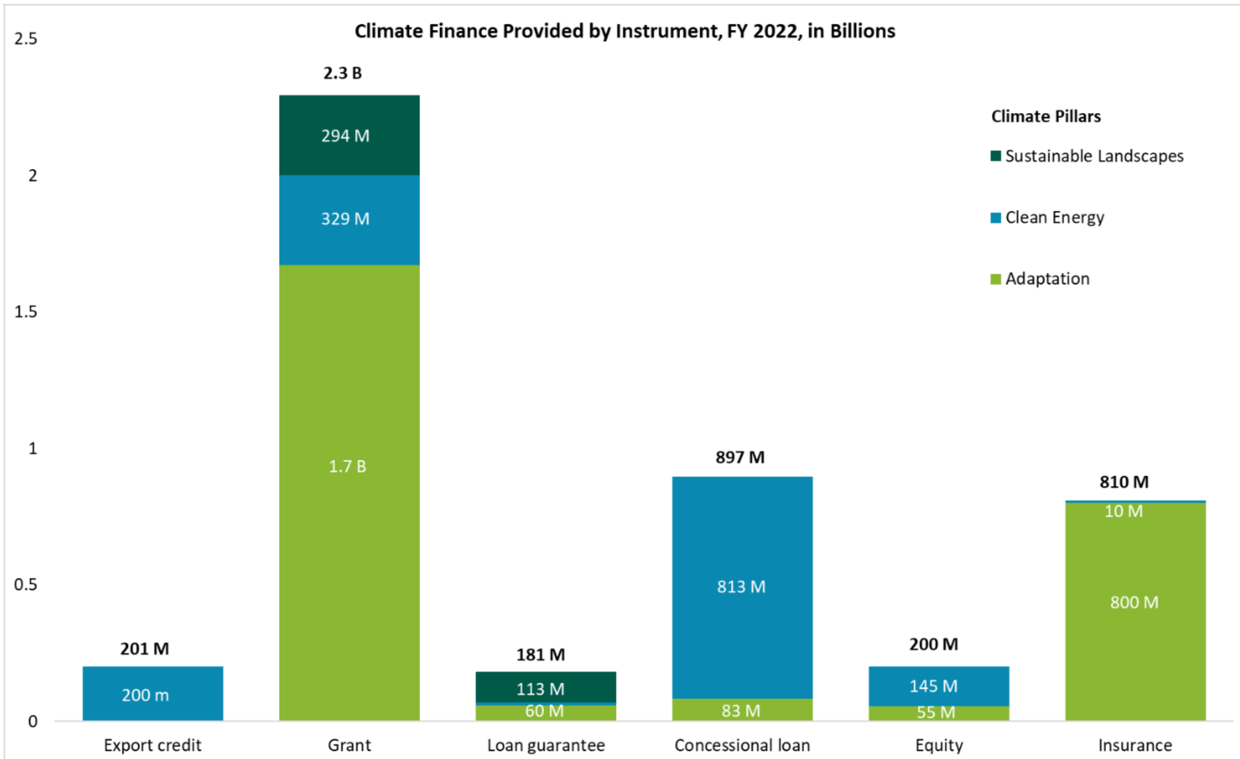
Financial Instruments

This sub-section addresses elements of paragraph 121f and 121g of the MPGs.

The United States uses a range of financial instruments and interventions through bilateral and multilateral channels. These include grants; risk mitigation tools such as guarantees and insurance; and low-cost, long-term lending. For the purposes of this Biennial Transparency Report, loans are defined as concessional where terms are extended to borrowers which are substantially more favorable than would otherwise be available on the private market. All loans provided by the United States during this reporting period are considered to be concessional and are reported at face value. Together, these instruments are helping to mobilize private climate finance by providing a robust, yet flexible, toolkit that is prioritized and adapted according to each country's unique needs, circumstances, and specific financing and investment barriers. As shown in Figure 5-2, from FY 2021-2022, the United States provided climate finance predominantly in the form of grants ($3.3 billion), followed by concessional loans ($1.9 billion) insurance products ($1.2 billion), loan guarantees ($397 million), equity ($213 million), and export credits ($212 million).

Figure 5-2: Climate Finance Provided by Instrument, FY 2021-2022





Geography

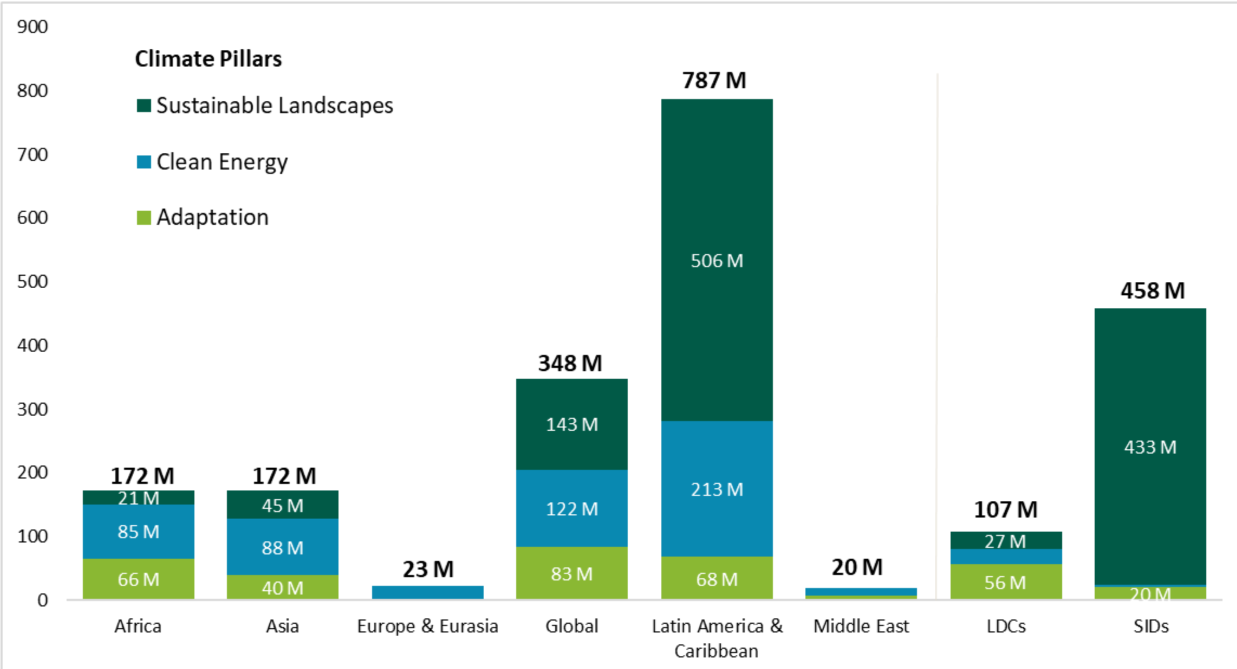
This sub-section addresses elements of paragraph 123c of the MPGs.

U.S. climate finance is provided through both country-specific programs and multi-country programs that often have a regional or global focus. While finance provided by some departments and agencies is more demand-driven and available for all eligible countries to access, U.S. grant-based assistance (other than funds used for multilateral activities) is often designated by Congress for specific countries or regions, with the exception of funds that are appropriated for multilateral climate activities.

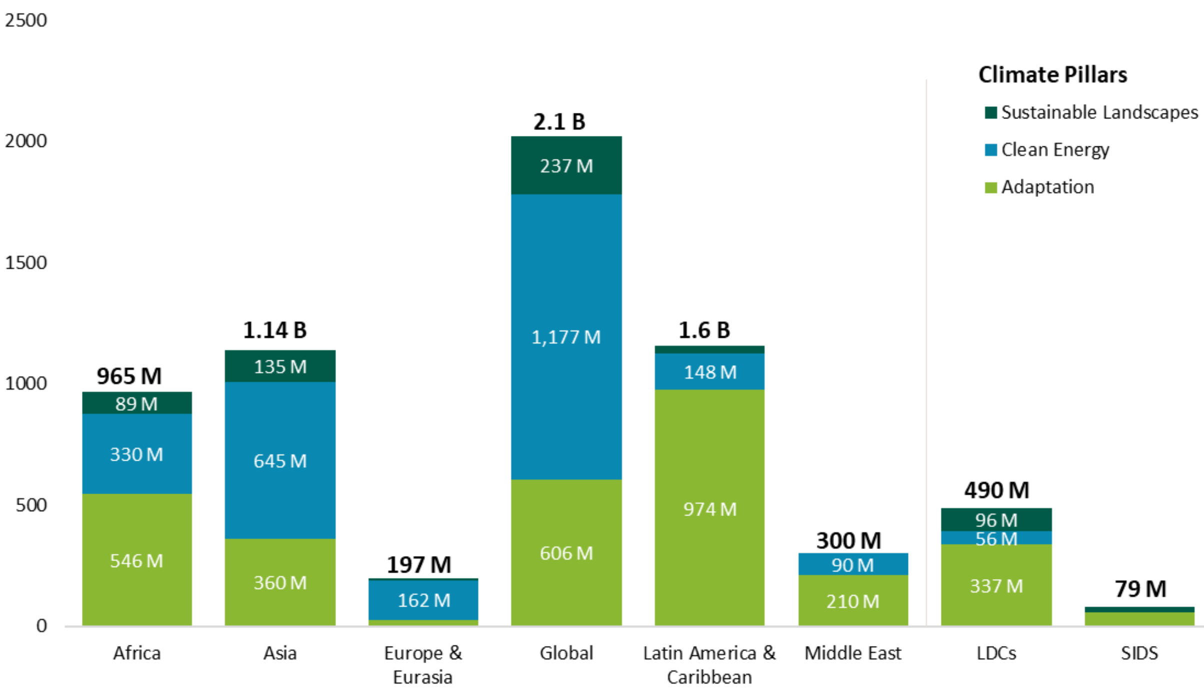
Figure **5-3** presents a geographic breakdown of U.S. climate finance that can be attributed to a particular region. From FY 2021-2022, approximately 33 percent of total U.S. climate finance provided went to global or multi-regional programming, 27 percent to Latin America and the Caribbean, 18 percent to Asia, 16 percent to Africa, and the balance to developing economies in Europe and Eurasia and the Middle East. Eight percent went to least-developed countries (LDCs) and six percent to small island developing states (SIDS), noting that these categories intersect with regional classifications and one another, and that some global and regional projects include additional finance to LDCs and SIDS.

Figure 5-3: Climate Finance Provided by Region, FY 2021-2022

Climate Finance Provided by Region, 2021



Climate Finance Provided by Region, 2022



Pillars

This sub-section addresses elements of paragraph 121h of the MPGs.

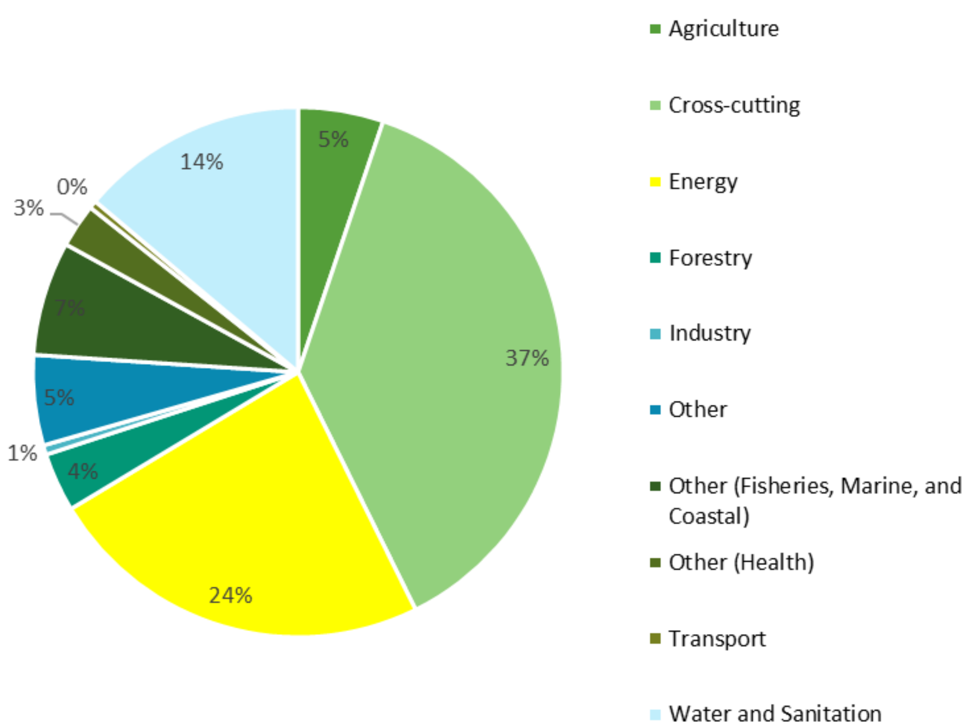
U.S. climate finance supports activities across three main pillars: adaptation, clean energy, and sustainable landscapes (forests, agriculture, and other land uses). For the purposes of the Common Tabular Format (CTF) tables, clean energy and sustainable landscapes projects are listed as "mitigation." For FY 2021-2022, approximately 42 percent of total U.S. climate finance supported clean energy activities, 40 percent supported adaptation activities, and 17 percent supported sustainable landscapes activities. 66 percent of adaptation finance, 54 percent of sustainable landscapes finance, and 23 percent of clean energy finance was provided in the form of grants.

On a sector specific level, approximately 37 percent of U.S. bilateral climate finance supported cross-cutting projects, 24 percent supported clean energy, 14 percent supported water and sanitation activities, 5 percent went to agriculture-specific activities, and 4 percent supported forestry activities. Additionally, 15 percent supported projects listed as "other," including health and ocean, fisheries, and coastal activities, as seen below in

Figure 5-4.

Of adaptation support, the largest share of funding, approximately 33 percent, was allocated to water and sanitation activities and 21 percent to cross-cutting. For mitigation activities, approximately 55 percent went to clean energy projects, while 28 percent went to cross-cutting projects. Cross-cutting activities are defined as activities that fit within multiple thematic sectors, while the “other” category encompasses all activities that do not fit into the nine other defined categories.

Figure 5-4 Bilateral Climate Finance Provided by Sector, FY2021 2022



At this time, data limitations prevent reporting at the sub-sectoral level.

The following sections provide a sample of initiatives within each pillar, while Annex 5 provides information at the project level for each activity, including on the type of support and its sectoral focus.

Adaptation

The impacts of climate change are already being felt around the world. They threaten national security, undermine global economic development, exacerbate geopolitical tensions, and result in greater global and local instability, as well as a rising need for humanitarian assistance. Working with partners to catalyze and scale adaptation action remains a top priority of the United States.

The United States is committed to helping vulnerable countries adapt to climate change and enhance the resilience of their communities and economies. The United States committed approximately $3 billion from FY 2021-2022 to activities that promote climate resilience in developing countries.

The United States has prioritized climate adaptation assistance for countries, regions, and populations that are highly vulnerable to the impacts of climate change, with particular emphasis on SIDS and LDCs, especially in sub-Saharan Africa. By increasing resilience in areas such as food security, water, coastal management, and public health, U.S. support helps vulnerable countries prepare for and respond to increasing climate- and weather-related risks.

The magnitude of the challenge requires not only dedicated adaptation programming and finance flows, but also a broader approach to international development that fully integrates resilience to climate change. Development investments in areas as diverse as preventing and treating malaria, building hydropower facilities, improving agricultural yields, and developing urban infrastructure will not be effective in the long term if they do not account for such impacts as shifting ranges of disease-carrying mosquitoes, changing water availability, or rising sea levels. Examples of U.S.-supported adaptation activities in FY 2021-2022 include:

- **Ocean Finance Company**: In 2022, the United States supported marine conservation in the Galápagos Islands, enabled through a debt conversion that will create near-and long-term funding for biodiversity protection. The transaction is expected to generate more than $450 million for marine conservation in the Galápagos Islands and more than $1.1 billion in lifetime savings for Ecuador through reduced debt service costs.
- **Observing Ocean Warming-Argo Project:** The United States provided $11.4 million in FY2021 and $11.7 million in FY 2022 grant funding for financing for the Observing Ocean Warming-Argo project in partnership with other countries to observe important signals of climate change including changes in ocean temperature, heat content, and sea level rise. Understanding changes in the ocean temperature directly affects long term weather forecasting. The Argo Program's data are used by operational forecasting centers around the world and have greatly improved the accuracy of the 10-day forecast. Through the combined efforts of 22 countries, this effort will increase the global coverage of Argo which is essential for understanding year-to-year variability and decadal trends in ocean heat content driven by climate change.
- **Resilience and Adaptation Mainstreaming Project (RAMP):** RAMP supports the overarching objectives of PREPARE to improve adaptation planning and to mobilize finance for adaptation by improving the capacity of developing country central ministries, including finance and planning, to assess and embed climate risk into budgets, plans, policy, and operations. RAMP leverages local universities to provide training and capacity building to governments. A $6 million grant in FY 2021-2022 has

helped establish a network of lead universities, develop core RAMP curriculum, and train university staff to teach this material. Moving forward, funding will help vulnerable country governments increase their use of standard processes and tools to integrate climate risks and planning into national budgets and plans; increase incentives for both public and private financing to meet the scale of need; and enhance resilience of people, communities, and economies in the most vulnerable countries through better management of financial and economic risks.

- **LDC Initiative for Effective Adaptation and Resilience (LIFE-AR):** LIFE-AR will support LDCs in strengthening local ownership of climate solutions and achieving a climate resilient future, funded in FY 2021-2022 by a $3.5 million grant. Through LIFE-AR, LDC front-runner countries are integrating climate resilience and adaptation into national and local development objectives; developing strong climate finance architecture to help ensure that at least 70 percent of climate finance received supports locally led climate action by 2030; and building capacity and strengthening governance to develop more effective and inclusive climate decisions. The initiative aims to increase the resilience of 31 million people by 2030 and prioritizes the inclusion of disadvantaged groups in climate action to deliver effective whole-of-society action. LIFE-AR will also develop inclusive and transparent systems of monitoring and learning. LIFE-AR began its work in six front-runner countries: Bhutan, Burkina Faso, Ethiopia, The Gambia, Malawi, and Uganda. At the 28th UN Climate Change Conference, Benin, Madagascar, Nepal and Senegal joined existing frontrunner countries in signing up to LIFE-AR.

- **Systematic Observation Finance Facility (SOFF):** Through PREPARE and in support of the UN Secretary General's Early Warnings for All Initiative, the United States is supporting SOFF to close the basic weather and climate observations data gap. Improving the availability of weather and climate observations, particularly from the most data sparse areas, is vital for weather forecasts, early warning systems, and climate information services that help save lives and livelihoods. In the first two years of operation, SOFF has delivered readiness support to more than 60 countries and has been allocated a $13.6 million grant for FY 2021-2022.

Clean Energy

From FY 2021-2022, the United States committed approximately $3.1 billion to finance clean energy activities in developing countries. This climate assistance focused on countries and sectors offering significant emissions reduction potential over the long term, as well as countries that offered the potential to demonstrate leadership in sustained, large-scale deployment of clean energy. In terms of sector coverage, clean energy includes renewable energy and energy efficiency, and excludes direct expenditures on unabated natural gas and other fossil fuel power plant construction or retrofits.

The United States supports countries to develop enabling environments that foster private investment to scale up clean energy, for example, by providing technical assistance to energy system planners, regulators, and grid operators to improve the capability of regional electricity grids to transmit clean energy. The United States also supports global programs that focus on information sharing and building coalitions for action on clean energy technologies and practices. Examples of U.S.-supported clean energy activities in FY 2021-2022 include:

- **Vietnam Partnership**: In 2022, the United States launched a new effort with Vietnam to integrate clean energy solutions, like rooftop solar, electric vehicles, waste-to-energy programs, and energy efficiency solutions for the power grid. This builds on a decades-long partnership to design, finance, and build clean energy sources across the country, which has contributed to Vietnam's exponential growth in solar energy production, growing from less than 10 megawatts (MW) in 2017 to over 16,500 MW—now representing more than 25 percent of the country's total power capacity.
- **Philippines Offshore Wind and Battery Storage:** In FY 2022, the United States granted $650,000 for a feasibility study to support the development of 3 gigawatts (GW) of offshore wind turbine generation in the Philippines. The project consists of eight to ten offshore wind sites, each with at least 300 MW of wind generation capacity, as well as battery energy storage systems. The grant is supporting identification of sites, technical analysis, and evaluation of financing options, among other elements. The feasibility study supports the deployment of U.S. technologies and services to support partner countries in meeting their climate mitigation objectives. As a product of this assistance a report was released in April 2024 providing an analysis of three high potential areas to accelerate the offshore wind market in the Philippines.
- **Egypt Nexus for Water, Food, and Energy Platform (NWFE):** Funding for NWFE-EP will support the decommissioning of 5,000 MW of inefficient natural gas-fired power plants and help deploy up to an additional 10,000 MW of renewable energy capacity in Egypt. NWFE, backed by a $25 million grant, will support the deployment of renewables by developing a pipeline of investable wind and solar projects, securing investment in those projects, and supporting complementary grid strengthening work. It will also aid the Egyptian government in project preparation for individual plant closures for gas plants that have been identified for decommissioning.
- **Clean Energy in Guatemala, Honduras and Brazil:** The United States has provided $82.7 million in guarantees in fiscal years 2021 and 2022 for expanding clean energy projects

in Guatemala, Honduras, and Brazil, enabling the expansion and study of distributed solar and nuclear energy across the region.

- **Solar Hybrid Mini Grids in Nigeria:** In FY 2021, the United States funded a feasibility study to support the deployment of up to 150 solar hybrid mini-grid systems to provide affordable and reliable energy access to primary healthcare sites and their neighboring communities within Bauchi, Ebonyi Kebbi, and Sokoto Sates and the Federal Capital Territory in Nigeria. The feasibility study determined and finalized the design and technical specifications of the mini-grid systems and analyzed the commercial viability of implementing mini-grid systems offering up to 37.2 MW of new renewable capacity and providing electricity for up to 150 primary healthcare facilities and over 300,000 nearby houses. The project is expected to begin implementation in 2025.

Sustainable Landscapes

GHG emissions from deforestation, agriculture, and other land uses constitute approximately one-quarter of global emissions. In some developing countries, land sector GHG emissions can account for as much as 80 percent of total emissions. At the same time, natural climate solutions that conserve, sustainably manage, and restore forests and other ecosystems could contribute around one-third of the pre-2030 mitigation potential needed to align with the Paris Agreement temperature goal. To meet the challenge of reducing these emissions, the United States works with partner countries to put in place the systems and institutions necessary to reduce global land-use-related emissions, supports the provision of data and information about forests and land use, and works to create new models for rural development that generate climate benefits, while conserving biodiversity, protecting watersheds, and improving livelihoods.

For activities related to land-use mitigation (or “sustainable landscapes”), including reducing emissions from deforestation and forest degradation (REDD+), U.S. assistance works to (1) reduce GHG emissions from deforestation and other land uses; (2) increase the sequestration of carbon stored in trees, plants, and soils; and, through these actions, (3) generate additional social and environmental benefits, such as good governance, enhanced resilience, and biodiversity conservation. The United States further supports integration of forests, agriculture, and other lands into the development and implementation of ambitious nationally determined contributions, and into reporting national inventory reports and BTRs.

FY 2021-2022, the United States committed approximately $1.2 billion to support developing countries in protecting and restoring carbon-rich ecosystems; improving agricultural practices; enhancing land-use planning; building monitoring capacity; attracting investment that supports forest and climate objectives; and enhancing the systems that underpin these activities. U.S. support prioritizes the mitigation potential of investments; countries with the political will to implement large-scale efforts to reduce emissions from deforestation, forest degradation, and other land-use activities; and potential for complementary investments in monitoring, reporting, and verification of forest cover and GHG emission reductions. Examples of U.S.-supported sustainable landscapes activities in FY 2021-2022 include:

- **Multinational Species Conservation Fund:** Through the Multinational Species Conservation Fund, supported by $31.7 million in 2022, the United States is providing grants and supportive assistance through implementing partners for Asian Elephant, Great Ape, African Elephant, and Marine Turtle conservation. These activities will promote sustainable land use practices through the conservation of critical ecosystems, as well as supporting resilience and other co-benefits.
- **Indigenous Peoples Finance Access Facility:** The Indigenous Peoples Finance Access Facility aims to bolster the capacity of Indigenous Peoples Organizations (IPOs) to access funding for the conservation, restoration, and improved management of their territories, specifically forests. Starting in 2022, a $2 million grant supported directly IPOs from the community, national, and regional levels in Asia, South America, and Africa, with a particular focus on IPOs from the following countries: Indonesia, Thailand, Nepal, the Philippines, Tanzania, Kenya, Democratic Republic of the Congo, Guatemala, Ecuador, Peru, Panama, and Brazil. Designed in collaboration with Indigenous Peoples, the project aims to increase access by IPOs to information related to funding opportunities for their self-developed projects related to stewarding forests; increase the skills of representatives of IPOs to develop, write, submit, and manage project proposals; develop a pool of leaders who can serve as trainers; facilitate access to legal services to overcome barriers connected to accessing funding; and create learning opportunities between IPOs and donors.
- **Modern Cooking for Healthy Forests in Malawi - Tiphike Mwa Makono:** In Malawi, illegally and unsustainably produced charcoal has doubled in the last ten years, causing deforestation and carbon emissions to spike. The United States is easing pressure on forests by accelerating the supply of good quality, sustainably produced charcoal for cooking. The project, backed by a $3.3 million grant, is designed to support the Government of Malawi to promote sustainable forest management of selected landscapes, promote sustainable energy options in selected urban areas in order to maintain forest cover, and reduce land-based emissions.
- **One Acre Fund:** In Sub-Saharan Africa, a U.S. loan to One Acre Fund (up to $20 million in financing) is helping facilitate the provision of agricultural inputs, mainly fertilizer, and

services on credit to approximately 412,000 smallholder farmers (1,648,000 farming household members), including approximately 206,000 female farmers, to increase their harvests.

Promoting Effectiveness

This sub-section addresses elements of paragraph 121q and 121p of the MPGs.

To promote effective use of climate finance, the United States works to ensure that its support is efficient, effective, and innovative; based on country-owned plans and strategies; and focused on achieving measurable results, with a long-term view of economic and environmental sustainability. The United States has also taken steps to ensure that support is aligned with the long-term goals of the Paris Agreement. Climate-specific finance is defined as activities that were conceived and funded specifically to achieve climate-related objectives, as well as activities that provide climate co-benefits across the pillars of adaptation, clean energy, and sustainable landscapes, which are directly linked to the mitigation and adaptation long-term goals of the Paris Agreement. Additionally, the U.S. climate finance definition (Annex 4) excludes direct expenditures on fossil fuels. Further, climate risk screening is undertaken across the full range of U.S. development assistance activities, including but not limited to climate finance activities.

Addressing the Needs and Priorities of Partner Countries

U.S. support across all pillars is country-driven, responding to the needs and priorities of partner countries. This is achieved in a variety of ways, including reviewing country-specific documents such as NDCs, Biennial Update Reports (and now BTRs), national GHG inventories, and National Adaptation Plans (NAPs) to target projects; working directly with partner governments and other in-country stakeholders to identify needs and develop implementation plans; and building multi-country programs around challenges or priorities identified across multiple countries during prior work.

The United States recognizes that climate action is often most effectively achieved through inclusive engagement with local, marginalized, and underrepresented groups. These groups include, but are not limited to, impoverished people and communities, women and girls, youth, persons with disabilities, religious minorities, ethnic and racial groups, LGBTQI+ people, displaced persons, migrants, and Indigenous Peoples and other marginalized communities. To help ensure climate finance enables development outcomes and just transitions to low-carbon economies, it should:

- Ensure participation of local, marginalized, and underrepresented groups in program design, planning, and management;
- Secure sizeable benefit-sharing directly to local communities under carbon markets and other payment for ecosystem services; and
- Promote empowerment of civil society, including equitable ownership over development programs, initiatives and outcomes.

Response Measures

The United States underscores the importance of supporting countries in building their capacity to respond to and address any socioeconomic impacts of the implementation of their response measures. U.S. financial support provided for mitigation and adaptation aims to, where possible and appropriate, help countries maximize positive and minimize negative socioeconomic impacts that may be associated with the transition to net zero GHG emissions.

Scaling Down Support for Carbon-Intensive Fossil Fuels

Achieving shared climate objectives depends not only on investing in low-carbon activities, but also on scaling down support for high-carbon activities. Shifting investment from those that support or subsidize fossil fuel use, or other high-emission activities, towards lower-emission alternatives remains a priority of the United States.

In 2021, the U.S. Treasury Department issued new guidance for considering projects at the multilateral development banks that opposes coal and oil projects, and only narrow support for natural gas. Additionally, all Federal agencies have been directed to halt support for unabated fossil fuel projects overseas.

Technology & Capacity Building

This sub-section addresses elements of paragraph 122 of the MPGs.

The United States integrates support for technology development and transfer and capacity building throughout its international climate finance. Each actor within the U.S. government that provides support is encouraged to report on any aspects of its projects – regardless of pillar or instrument – that contribute to technology development and transfer and/or capacity building. Further detail on the underlying assumptions, definitions, and methodologies used is captured in Annex 4.

C. Information on Financial Support Provided and Mobilized

Just Energy Transition Partnerships

To achieve the goals of the Paris Agreement, avoid the most devastating impacts of climate change, and align with the outcome of the global stocktake at the 28th UN Climate Change Conference, high-emitting emerging markets must urgently accelerate their transition away from fossil-fuel energy sources. This transition requires strong political will, an enabling policy environment that levels the playing field for investments, and public and private sector financing to scale deployments of clean and renewable energy resources. The Just Energy Transition Partnership model aggregated public and private sector financing and aligned resources with efforts to support partner countries in the achievement of their ambitious climate targets.

South Africa, alongside the International Partners Group—composed of the United States and likeminded donor countries— announced the first Just Energy Transition Partnership (JETP) at COP26. The South Africa JETP mobilized $8.5 billion to support South Africa's energy transition. Later, two additional JETPs, with Indonesia and Vietnam, were announced. These JETPs mobilized $21.6 billion and $15 billion respectively. The United States and Japan serve as co-leads of the IPG for the Indonesia JETP.

The JETP are the first generation of country-led platforms that seek to support a country's ambitious climate strategy to decarbonize. A unifying goal of all country-led platforms is to support high-emitting developing countries that have strong policy interest in—and political commitment to—expediting their transition from carbon-intensive energy sources, particularly coal, to renewables while also supporting an inclusive and equitable transition for underserved communities on the front lines of the climate crisis.

Mobilizing Private Climate Finance

While maintaining a strong core of public climate finance is essential, the United States pursues strategies to maximize private investment in low-carbon, climate-resilient activities in developing countries. More efficient leveraging of private investment can allow limited public resources to be concentrated in areas and sectors where the private sector is less likely to invest on its own, particularly in adaptation activities in the most vulnerable countries and LDCs. This effectively multiplies the financing available to support partner countries' climate objectives. The key role of public finance in de-risking private investments can catalyze significant additional resources.

In FY 2021-2022, U.S. public interventions mobilized a total of $10.7 billion in private climate finance. Tables on financial support provided through bilateral and multilateral channels, as well as support provided, are included in Annex 5.

In many cases, the barriers to mobilizing private climate finance relate to a combination of factors, including poor incentives, challenges in engaging with host government regulatory processes, real or perceived risk, and lack of knowledge in the commercial banking sector about climate-friendly opportunities. U.S. bilateral assistance targets technical assistance to address these and other issues. Moreover, the United States is committed to working with partners to make finance flows consistent with a pathway towards low GHG emission and climate-resilient development, shifting the trillions of dollars under financial management to support climate action at scale. The following are examples of ways the United States has worked to achieve these outcomes:

- **Green Invest Asia:** Green Invest Asia provides technical assistance to the private sector to reduce deforestation and high-emissions agriculture across Southeast Asia. At least 40 percent of greenhouse gas emissions in the region come from commercial agriculture, forestry and other land use operations. The project and its successor, the Partnership for Green Investment, aim to catalyze private finance to scale up investments in the sector for profitable, low-emissions business models by supporting progressive actors. For example, Green Invest Asia worked with financial institutions to increase their potential to reduce emissions as reflected in their capacity adopt environment, social, and governance standards. In 2021-2022, the project mobilized over $104 million from private sector actors.

- **Dolma Fund II:** An equity investment in Dolma Impact Fund II will support investments in renewable energy, among other sectors. Dolma Fund Management, the first private equity fund manager dedicated to investing in Nepal, will target investments that reduce dependence on imported energy, help mitigate the impacts of flood, landslide, and drought on its largely agrarian economy, while promoting the introduction of technology that promotes financial inclusion. The U.S. investment of $4 million in 2021 mobilized over $3.4 million in additional capital.

- **U.S.-Africa Clean Energy Finance Initiative (ACEF):** ACEF provided grants to offset the costs of early-stage project development to attract investment. In one project in Nigeria, the United States worked with a local firm to support the feasibility studies for over 110 solar mini-grids with integrated battery storage technology in Oyo and Osun states as well as the Federal Capital Territory. 22 sites received $4.6 million in financing from the Nigeria Infrastructure Debt Fund to complete construction, and others are in the late stages of due diligence for investment from other funders.

The United States also contributes to multilateral climate funds, which in turn mobilize significant amounts of private capital:

- The **Global Environment Facility (GEF)** has a long history of catalyzing private sector investment. The GEF is mainstreaming private sector engagement into strategies across its climate portfolio and Integrated Programs. Additionally, the GEF's non-grant instrument window supports innovative financing models with robust private sector engagement. Examples of private sector co-finance for GEF projects range from agricultural businesses investing in zero-deforestation production to collaboration with appliance and equipment makers to accelerate the adoption of energy efficient hardware.
- The **Climate Investment Funds' Clean Technology Fund** has a long history of catalyzing private sector investment through country investment plans and through its series of dedicated private sector programs. The CTF uses a full range of financial instruments to facilitate private finance mobilization. CTF private sector investments run the gamut from programs dedicated to helping local small- and medium-sized enterprises to invest in energy efficiency to facilitating significant private sector investment in utility-scale renewable energy installations.

Improving the Tracking of Mobilized Private Climate Finance

This sub-section addresses elements of paragraph 121o of the MPGs.

As stated above, the United States defines private climate finance mobilized as the amount of additional finance invested in supporting climate change mitigation and/or adaptation in a developing country as a result of U.S. government assistance, whether financial or non-financial. Private climate finance mobilized includes private finance for climate-relevant activities that has been mobilized by public finance or by a public policy intervention, including technical assistance to enable policy and regulatory reform.

To account for mobilized private climate finance, we assess the amount of private finance mobilized on an activity-by-activity basis and report on private finance associated with activities both where there is a clear causal link between a public intervention and private finance and where the activity would not have moved forward, or moved forward at scale, in the absence of U.S. government intervention. To avoid double-counting, all private climate finance mobilized refers to the private sector and excludes finance from developing country governments, other contributor governments, or multilateral finance institutions.

The U.S. methodology for defining and tracking private climate finance mobilized aims to ensure that reporting encourages and incentivizes the most effective use of climate finance, while accurately reflecting the full breadth of U.S. support.

We have drawn on the work of the Research Collaborative on Tracking Private Climate Finance and the common methodological framework to track progress towards the collective $100 billion goal as we have worked to continuously improve our reporting of private climate finance mobilized. The United States has also worked directly with other contributor countries to harmonize our approach.

Current data and methodological limitations prevent the United States in some cases from:

- Attributing private climate finance mobilized to specific instances of public finance provision, owing to the multi-year nature of many activities;
- Reporting mobilization at the project level due to the confidential nature of deal terms; and
- Capturing the full breadth of private climate finance mobilized through public policy interventions.

As such, estimates throughout this chapter are necessarily partial and omit some—possibly a substantial amount of—private climate finance mobilized.

D. Information on Support for Technology Development and Transfer

Technology Development & Transfer

This sub-section addresses elements of paragraphs 121k and 126a-f of the MPGs.

Accelerating climate-related technology transitions abroad is a powerful lever for the United States and its international partners to address the climate crisis. This section outlines the U.S. government's approach to technology development and transfer and provides several illustrative examples of U.S.-supported activities.

Cooperative action on technology development and transfer, as called for by Article 10 of the Paris Agreement, drives down costs of climate technologies and enables countries to raise ambition, mitigate emissions, and strengthen resilience to climate impacts at the necessary scale, cost-effectively and quickly. Foreign assistance that incorporates technology development and transfer on voluntary and mutually agreed terms advances climate action internationally and aligns with U.S. leadership on technology and innovation.

As multitrillion-dollar international markets for clean energy and other climate-related technologies evolve, the United States supports the development of technologies that other countries need to decarbonize and aligns its clean energy diplomacy and investments with its domestic industrial agenda. This applies to technologies that support reduced emissions from land use, and technologies that support adaptation and resilience to climate impacts as well as clean energy and decarbonization.

Multilateral Cooperation on Technology through the UNFCCC and Paris Agreement Processes

The United States continued to play a leading role in the Technology Mechanism, composed of the Technology Executive Committee (TEC) and the Climate Technology Center & Network (CTCN), during the reporting period, following the overarching guidance contained in the Paris Agreement Technology Framework (decision 15/CMA.1). The TEC provides policy guidance to the Parties to the UNFCCC and the Paris Agreement. The CTCN is the implementation body of the Technology Mechanism.

At the 26th UN Climate Change Conference (2021), the United States proposed that the TEC and CTCN coordinate their work through a joint work program, following calls in previous COP decisions for increased synergy between the two bodies. As vice chair of the CTCN Advisory Board from 2022-2023, and then chair from 2023-2024, the United States helped lead the development and implementation of the Joint Work Program of the Technology Mechanism for 2023-2027 (JWP), which the TEC and CTCN approved in 2022. U.S. Special Presidential Envoy for Climate John Kerry joined UN Climate Change Executive Secretary Simon Stiell and UNEP

Executive Director Inger Andersen, along with other senior officials, at the launch of the JWP at the 27th UN Climate Change Conference (2022).[3] The United States supports the JWP's emphasis on national systems of innovation, digitalization, enhanced engagement with business and industry, and other key themes. The United States contributed $3 million to the CTCN in 2022.

Strategies employed to support technology development and transfer

The U.S. strategy for supporting cooperative action on technology development and transfer aligns with Paris Agreement Article 10 and emphasizes integration of technology with technical assistance and capacity building that focuses directly on mitigation and adaptation objectives. Thus, many of the examples described above regarding foreign assistance programs that leverage climate finance for clean energy, adaptation, and sustainable landscapes have technology components embedded within those projects. The following section highlights examples of foreign assistance projects that reflect this mainstreaming approach but also have an explicit emphasis on technology development and transfer.

While the initiatives listed in Annex 5 provide insight into some of the success stories related to U.S. engagement in technology transfer and development, challenges remain. One key challenge has been to attract the finance necessary to successfully develop, demonstrate, and deploy climate technologies, particularly for adaptation and resilience. In some cases, this is due to limited domestic capacity in host countries and insufficient domestic frameworks to foster trade and investment and protect intellectual property. Insufficient investment in early stages of technology development, before technologies become commercially viable, and a failure to provide adequate regulations and policy incentives to drive investment in climate technology solutions, are common challenges. To address these challenges, the United States has supported a number of programs such as those highlighted below.

Illustrative Examples of Activities that Support Climate-Related Technology Development and Transfer

The United States financed a wide range of programs that support climate-related technology development and transfer consistent with Article 10 of the Paris Agreement, through bilateral and multilateral channels. Several examples of these activities are highlighted below and in Annex 5, though it is important to note that the table in Annex 5 is a representative, but not comprehensive, list of U.S. support provided for climate-related technology development and transfer. In addition, several activities highlighted elsewhere in this chapter also advance technology development and transfer.

Clean Energy Technology:

- **Clean Energy Investment Accelerator** – The Clean Energy Investment Accelerator (CEIA) program enables the accelerated deployment of clean energy technology by leveraging private sector demand to overcome policy and regulatory barriers. Through concerted engagement with public and private sector stakeholders, the CEIA is able to identify opportunities to scale up clean energy through innovative purchasing models and policy frameworks. Such an approach has enabled the CEIA to be successful despite working in unique national circumstances in each partner country. To date, the CEIA has been active in Mexico, Colombia, Indonesia, Philippines, and Vietnam and has been able demonstrable progress in the deployment of clean energy in each country. For instance, in Colombia, CEIA worked with a group of companies located at an industrial park to aggregate their rooftop solar projects to achieve an economy of scale that led to a price reduction of 24 percent compared to similarly sized projects.
- **Clean Technology and Trade Partnership Initiative -** The Clean Technology and Trade Partnership Initiative connects decarbonization needs in developing countries with U.S. clean technologies. It aims to partner with governments and the private sector in emerging economies to build capacity for clean technology adoption while deploying clean energy technology through trade in goods and services. This project is helping developing countries undertake ambitious emissions reduction measures and promote the flow of capital toward climate-aligned technology investments. The United States is supporting endogenous capacities to enhance technology development and transfer by promoting industry and government-to-government engagement on technology codes, standards, and regulatory frameworks, leading virtual or in-country workshops on enhancing financing mechanisms for clean technologies, and working with in-country stakeholders on engagement with emerging decarbonization and adaptation technologies. The activities support local development needs by partnering with and facilitating training for institutions that impact the local business environment for clean energy, including, for example, energy market regulators, utilities, permitting authorities, financing institutions, project developers, civil society stakeholders, municipal, local, state, and Federal authorities, among others.

Adaptation/Resilience Technology:

- **SERVIR:** SERVIR partners with countries and organizations to support locally led efforts to strengthen climate resilience, food and water security, forest and carbon management, and air quality. Together with its partners, SERVIR uses satellite data from space to predict and track droughts, floods, and extreme weather. These climate challenges can devastate families and entire nations but by strengthening in-country systems to provide actionable information on the timing and magnitude of climate hazards those risks can be identified and managed, thus protecting lives and livelihoods. SERVIR has a demonstrated track record of strengthening food and water security, improved climate resilience, and helping countries monitor and manage forests for carbon, biodiversity, and other ecosystem services.

- **Climate Resilience and Adaptation Finance & Technology (CRAFT):** To accelerate technology transfer in support of adaptation and resilience, the United States is supporting a technical assistance (TA) facility under the Climate Resilience and Adaptation Finance & Technology (CRAFT) fund. CRAFT is a first-of-its-kind growth equity, climate resilience-focused investment fund and was incubated out of a previous U.S.--funded program, the Global Innovation Lab, in 2016. CRAFT has since closed on $186 million in commercial investment. In 2021, the United States, along with Nordic Development Fund, set up a technical assistance facility so that the adaptation technologies, products, and services from CRAFT could be brought to lower-income and small island markets. The CRAFT TA Facility does this by supporting feasibility/market studies, project preparation, and initial capital investment. Since the operationalization of the CRAFT TA Facility in 2022, pilot projects have begun in Papua New Guinea and India.

Sustainable Landscapes and Climate-Smart Agricultural Technology:

- **Forest Data Partnership:** The Forest Data Partnership aims to address a key barrier to private investment in technologies that support forests and restoration - the lack of reliable and accessible data on forests and lands. The Forest Data Partnership works with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions.

- **Global Fertilizer Challenge:** In 2022, the United States launched the Global Fertilizer Challenge, which raised $135 million in funding for fertilizer efficiency and soil health programs to combat fertilizer shortages and food insecurity. The United States initiated two Global Fertilizer Challenge projects, Fertilize Right, and the Efficient Fertilizer Consortium, which foster the development and adoption of new and alternative efficient fertilizer technologies and practices. The "Fertilize Right" initiative supports the development and transfer of technologies that improve fertilizer-use efficiency, effectiveness, and alternatives to enhance food security and reduce climate emissions from agriculture in Brazil, Colombia, Pakistan, and Vietnam. Researchers from the U.S. and in-country partners support technical collaboration between the United States and partner countries in cutting-edge fertilizer research and innovation. For example, the United States is collaborating with Embrapa researchers in Brazil to develop alternative fertilizer products, agricultural practices, and new data tools to reduce fertilizer emissions and improve food security in Brazil. Through the second Global Fertilizer Challenge project, the Foundation for Food and Agriculture Research has established the Efficient Fertilizer Consortium with eight government and industry partners[4] to fund applied research that accelerates development and wider adoption of novel fertilizers. Research priorities include advancing the development of alternative fertilizers to improve efficiency, quantifying the environmental impact of current and novel fertilizers to provide support for farmers and retailers making management decisions, and improving emissions factors for nitrogen fertilizers to improve accuracy in emissions reporting.
- **SilvaCarbon:** SilvaCarbon, initiated in 2011, is a flagship multi-agency technical assistance program. SilvaCarbon works in over 25 countries to enhance endogenous capacity for national inventory and measurement, reporting, and verification (MRV), improving their ability to develop and utilize technologies to monitor and report on forests and associated net emissions in forests, agriculture, and other lands. Responding directly to country priorities, SilvaCarbon assists key partner countries in improving their international reporting, land management planning, and ability to access results-based payments programs (including the LEAF Coalition). The program conducts trainings and workshops, provides technical assistance, develops tools, and fosters regional and international exchanges to encourage south-south cooperation. Activities are carried out on a national and regional level, and include development of National Forest Inventories, deforestation and wildfire hotspot detection systems, and analytical software to assess deforestation. SilvaCarbon has enabled data collection and monitoring systems that are fundamental to development and tracking progress towards NDCs, as well as national- and subnational-level REDD+ programs.

In addition to the information contained herein and in Annex 5, we encourage readers to review U.S. contributions in connection with the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), specifically its reporting in connection with obligations under Article 66.2, which requires developed country WTO Members to provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to LDC WTO Members in order to enable them to create a sound and viable technological base. The United States' most recent report describes a number of these technology transfer programs conducted in fiscal year 2023. The United States also submits a parallel report in connection with Article 67 of the TRIPS Agreement regarding technical and financial cooperation in favor of developing country and LDC WTO Members. The United States' most recent report provides a chronological list of programs conducted by the United States from September 2023 to September 2024.

E. Information on Capacity-Building Support

Capacity-Building

This sub-section addresses elements of paragraph 121k and 128a-e of the MPGs.

The United States recognizes that capacity-building plays a fundamental role in supporting urgent climate action aligned with efforts to limit global average temperature to 1.5°C; that it is critical for long-term durable, independent, and rapid climate action and sustainable development; and that it plays an important role as an enabling tool for the implementation of the Paris Agreement.

The United States also recognizes that capacity-building must be country-driven, based on and responsive to national needs, and foster country ownership by Parties, particularly developing country Parties. At the same time, it is also important to continuously evaluate the effectiveness of capacity-building efforts over time to identify gaps and needs in implementing capacity-building in developing countries so that such efforts are locally and nationally owned, and ultimately can be maintained and enhanced, independent of international support.

With that in mind and considering that having a long-term view of climate change and development is crucial for sustainability and results, the United States approaches capacity-building support in an integrated manner. The United States integrates capacity-building into the design of relevant projects and programs, as opposed to providing standalone support that exclusively addresses capacity-building. This helps ensure that capacity built is included in as many programs and projects as possible and that it is relevant, effective, and tied to results.

Existing and emerging capacity building needs are addressed throughout all U.S. capacity-building activities, not as separate line items of projects, and are provided as means for taking action on a mutually shared goal.

Illustrative Examples of Capacity-Building Activities

U.S. capacity building activities cover multiple priority and gaps in developing countries on issues related to mitigation, adaptation, and technology development and transfer. The examples and/or case studies highlighted below and in Annex 5 illustrate how U.S. capacity-building projects and programs implement policies that promote capacity building, involve relevant stakeholders, and promotes sharing best practices and lessons learned in undertaking effective climate action. The table in Annex 5 is a representative, but not comprehensive, list of U.S. support for climate-related capacity-building activities.

- **Paris Agreement Transparency Accelerator:** The Paris Agreement Transparency Accelerator was established to help developing countries transition to meet Paris Agreement reporting requirements, including by developing sustainable GHG inventory management systems that enable transparent, accurate, complete, comparable, and consistent reporting, and building capacity to report on other sections of BTRs. Technical assistance under this program includes helping developing countries improve their technical and institutional capacity – through a learning-by-doing approach – to develop and report high-quality BTRs to meet Paris Agreement reporting requirements on a sustainable, timely basis. The Transparency Accelerator focuses on assisting countries with reporting priorities related to (a) GHG inventories; (b) NDC tracking progress; and (c) GHG projections. Lastly, the Transparency Accelerator develops tools and works directly with national inventory and transparency teams to establish, maintain, and improve sustainable GHG inventory management systems and produce high-quality BTRs on a regular basis. This approach has been developed from over two decades of experience preparing the Inventory of U.S. Greenhouse Gas Emissions and Sinks and lessons learned from working alongside developing country experts.
- **Comprehensive Action for Climate Change Initiative (CACCI):** In November 2022, the United States announced the global expansion of the CACCI, an effort to provide technical assistance to countries in support of their climate goals. CACCI was launched in 2021 with four initial countries receiving technical assistance to help them meet their commitments under the Paris Agreement; that number has since grown to 21 based on demand from partner countries. This assistance complements ongoing work with

partner countries to transition to renewable energy, conserve forests and lands, and prepare for climate impacts.

- **Bangladesh: Smart Grid Roadmap:** In FY 2022, the United States granted $1,490,800 for Power Cell, a Bangladesh government department responsible for power sector reform, to develop a roadmap for incorporating smart grid elements into the country's electric grid. The objectives of this study were to improve the reliability, affordability and resiliency of Bangladesh's electricity grid by strengthening the capacity of Bangladeshi power firms to leverage smart grid technologies. The United States funded a follow-on feasibility study in FY 2023 (Phase II) that will help identify and plan smart grid pilot projects for the Power Grid Company of Bangladesh and the Dhaka Power Distribution Company. Phase II is still in its early stages.
- **Dominican Republic: Energy Storage Regulatory Roadmap:** In FY 2021, the United States granted $619,350 to support the development of regulations to enable the deployment of battery energy storage systems (BESS) in the Dominican Republic. The objective of the Project is to address gaps within the regulatory framework for BESS including with respect to grid connection, performance, and economic remuneration. NexantECA, LLC implemented the activity under the grant following a competitive selection. NexantECA held a workshop in February 2024 with stakeholders from across the Government of the Dominican Republic, as well as the country's energy sector, to inform a proposal for new regulations, which will be an output of the technical assistance.

- **Global Climate Action Partnership (GCAP):** Following-on to the highly successful Low Emissions Development Strategies Global Partnership, which was launched by the United States in 2011, GCAP has grown to include over 150 members with active regional coalitions in Africa, Asia, and Latin America and the Caribbean. Funding for GCAP supports countries, especially small island states, to accelerate action and implementation of pathways toward decarbonization and resilience with a greater emphasis on enabling policies and regulatory frameworks, early mover technical projects and pioneering actions, investment mobilization, and governance structures. GCAP country participants develop and successfully implement ambitious and replicable climate strategies; transition key sectors to resilient, low emission systems; and build capacity for local technical experts and policymakers through communities of practice to work collaborate on real-time policy, technical, and market solutions to address clean energy, non-CO2 and sustainable landscapes challenges.

[1] "COP 29 Update: U.S. International Public Climate Finance." U.S. Department of State, November 18, 2024. https://www.state.gov/cop-29-update-u-s-international-public-climate-finance/

[2] "The Inflation Reduction Act's Benefits and Costs." U.S. Department of Treasury, March 1, 2024. https://home.treasury.gov/news/featured-stories/the-inflation-reduction-acts-benefits-and-costs

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[4] "FFAR & Eight Member Organizations Commit $8.45 Million to Efficient Fertilizer Consortium." Foundation for Food and Agriculture Research, September 5, 2024. https://foundationfar.org/news/ffar-eight-member-organizations-commit-8-45-million-to-efficient-fertilizer-consortium/

U.S. Biennial Transparency Report

Chapter 6: Information on Areas of Improvement

Chapter 6: Information on Areas of Improvement

Overview

Consistent with paragraph 7 of the annex to decision 18/CMA.1, this chapter should contain information on areas of improvement in relation to chapters 2 through 5 of this report. As this is the first Biennial Transparency Report (BTR) developed by the United States and the review thereof has yet to take place, there are not yet specific areas of improvement identified by the technical expert review team (TERT) listed in this chapter. In future years, this chapter will become important to track recommendations from the TERT and the implementation status of these recommendations in the second and subsequent BTRs.

While not required, this BTR takes into account key improvements based on the recommendations and encouragements provided by expert review teams on prior national climate reports, in particular, the *Fifth Biennial Report and Eighth National Communication (BR5/NC8)*. In addition, the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* includes planned areas for improvement across its sectoral chapters, along with a dedicated chapter on recalculations and improvements.

U.S. Biennial Transparency Report

Technical Annexes

Annex 1: Summary Table of Actions, Policies, and Measures

This table provides information on key U.S. federal actions, policies, and measures that support the implementation and achievement of the U.S. NDC, including several longstanding federal efforts that were reported in previous Biennial Reports and National Communications. This table does not present a comprehensive account of every action that supports U.S. greenhouse gas (GHG) emission reductions, but rather a selection of significant actions underway. Following this table is an explanation of actions, policies, and measures that were reported in the U.S. Eighth National Communication and Fifth Biennial Report (December 2022) that are either no longer in place or that are now being reported under different names for clarity purposes.

For entries with quantified estimates of GHG emission reductions, explanations of the estimation methodologies and assumptions used are provided in the Methodology Annex (Annex 2). For achieved GHG emission reductions, estimates are provided for the year 2022 where feasible, a year selected given data availability considerations and given that 2022 is the most recent year presented in the latest U.S. national GHG inventory, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*. For expected GHG emission reductions, estimates are provided for the year 2030 where feasible, a year selected given the U.S. has an NDC economy-wide target of reducing net GHG emissions by 50-52 percent below 2005 levels in 2030. In the table below, the abbreviation NA (not applicable) is used to indicate where an estimate would not be applicable, either because the effort started after 2022 and thus could not provide 2022 achieved reductions, or because the effort is anticipated to conclude before 2030 and thus could not provide 2030 expected reductions. The abbreviation NE (not estimated) is used to indicate where estimates are not currently available, for reasons explained in the Methodology Annex.

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Transport										
Credit for Qualified Commercial Clean Vehicles	The Inflation Reduction Act (IRA) provides a tax credit of up to 30% for qualifying commercial clean vehicles, up to $7,500 for light vehicles and up to $40,000 for other vehicles.	Provide incentive for investment in commercial clean vehicles.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2023	U.S. Department of the Treasury	NA	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Credit for Previously Owned Clean Vehicles	The IRA provides a tax credit of up to $4,000 or 30% for qualifying pre-owned clean vehicles.	Provide incentive for purchase of pre-owned clean vehicles.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2023	U.S. Department of the Treasury	NA	NE
Clean Vehicle Credit	The IRA provides up to $7,500 for qualifying clean vehicles, with values varying based on meeting critical minerals or battery component sourcing requirements, and certain other rules.	Provide incentive for purchase of new clean vehicles.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Alternative Fuel Vehicle Refueling Property Credit	The IRA provides an investment tax credit of 6% of the cost of alternative fuel vehicle refueling and charging property in low-income and non-urban areas. The credit is 30% for residential installations and for projects meeting prevailing wage and apprenticeship requirements.	Provide incentive for alternative fuel vehicle refueling and charging property in low-income and non-urban areas.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Clean Fuel Production Credit	The IRA provides a $0.20/gallon credit for clean non-aviation fuels and $0.35/gallon credit for clean aviation fuels. The credit value increases 5 times for projects meeting prevailing wage and apprenticeship requirements. *This will reduce GHG emissions from international transport.*	Provide incentive for production of clean fuels.	Economic Instrument	Adopted	Transport	CO2, CH4, N2O	2025	U.S. Department of the Treasury	NA	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Sustainable Aviation Fuel Credit	The IRA provides $1.25/gallon tax credit for the production of sustainable aviation fuels. The credit value increases by up to $0.50/gallon based on lifecycle greenhouse gas emissions. *This will reduce GHG emissions from international transport. (Note that fueling must occur in the U.S.).*	Provide incentive for production of sustainable aviation fuels.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2023	U.S. Department of the Treasury	NA	NE
Extension of Tax Credits for Biodiesel and Renewable Diesel	The IRA extends $1/gallon for biodiesel, biodiesel mixtures, and renewable diesel production. The credit increases by $0.10/gallon for small productions. *This will reduce GHG emissions from international transport.*	Provide incentive for production of biodiesel, biodiesel mixtures, and renewable diesel production.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Extension of Second Generation Biofuel Incentives	The IRA extends a $1.01/gallon tax credit for producers of second-generation biofuels. *This will reduce GHG emissions from international transport. (Note that fuel must be used in the U.S.).*	Provide incentive for production of second generation biofuel production.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Higher Biofuels Infrastructure Incentive Program	Provides grants for biofuel distribution at blender platforms down to the retail pump level. Increases available access to biofuels.	To increase the sales and use of higher blends of ethanol and biodiesel.	Economic Instrument	Implemented	Transport	CO2	2020	U.S. Department of Agriculture	NE	1,218

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Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Biofuels Demonstration Facilities	By 2030, build and operate 4-5 demonstration-scale integrated biorefineries with a focus on sustainable aviation fuels capable of >50% reduction in GHG emissions relative to petroleum.	Demonstrate biorefineries to produce sustainable aviation fuel to de-risk industrial buildout.	Other	Implemented	Transport	CO2, CH4, N2O	2021	U.S. Department of Energy	NE	NE
State and Alternative Fuel Provider Fleet Program	Requires covered fleets either to acquire alternative fuel vehicles as a percentage of their annual LDV acquisitions or to employ other petroleum-reduction methods.	Require fleets to purchase alternative fuel vehicles.	Regulatory	Implemented	Transport	CO2	1992	U.S. Department of Energy	NE	NE
BIL Electric Drive Vehicle Battery Recycling And 2nd Life Apps (Sec 40208)	Funded by the Bipartisan Infrastructure Law (BIL) to expand an existing program at the Department of Energy for research, development, and demonstration of electric vehicle battery recycling and second-life applications for vehicle batteries.	Support R&D for Recycling of EOL EV Batteries. Reduce cost throughout recycling process. i.e. collection, sorting, transportation, recycling facility, etc. Improve performance of recycled battery material.	Economic Instrument	Implemented	Transport	CO2	2022	U.S. Department of Energy	NE	NE
Vehicle Technologies Deployment (Clean Cities and Communities)	Provides technical assistance, consumer information, industry coordination, tools, knowledge-sharing, and cost-shared funding for local/regional projects that mitigate GHG emissions and reduce reliance on petroleum in the transportation sector.	Support the use of alternative fuel vehicles and other petroleum-reducing vehicle technologies.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	1993	U.S. Department of Energy	5,378	11,396

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Advanced Technology Vehicle Manufacturing Loan Program	Federal partnership to advance clean transportation nationwide through collaboration with communities by building partnerships with public and private stakeholders to create equitable deployment of clean transportation solutions that advance the nation's environment, energy security, and economic prosperity.	Deploy affordable, efficient, and clean transportation fuels; energy efficient mobility systems; and other fuel-saving technologies and practices.	Economic Instrument	Implemented	Transport	CO2	2008	U.S. Department of Energy	21,005	138,223
BIL Battery Manufacturing and Recycling Grants (Sec 40207c)	BIL program to provide grants to ensure that the United States has a viable domestic manufacturing and recycling capability to support a North American battery supply chain.	Increase U.S. manufacturing capacity of battery manufacturing and recycling, and enhance national security.	Economic Instrument	Implemented	Transport	CO2, CH4	2021	U.S. Department of Energy	NE	NE
BIL Battery Materials Processing Grants (Sec 40207b)	BIL program to provide grants for battery materials processing to ensure that the United States has a viable battery materials processing industry. Funds can also be used to expand our domestic capabilities in battery manufacturing and enhance processing capacity.	Increase U.S. manufacturing capacity of battery materials and enhance national security.	Economic Instrument	Implemented	Transport	CO2	2021	U.S. Department of Energy	NE	NE
BIL Battery and Critical Mineral	BIL program to award grants for research, development, and demonstration projects to create	Increase U.S. security of supply for critical minerals for batteries.	Economic Instrument	Implemented	Transport	CO2	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Recycling (Sec 40207f)	innovative and practical approaches to increase the reuse and recycling of batteries.									
IRA Domestic Manufacturing Conversion Grants (Sec 50143)	An IRA program to provide cost-shared grants for domestic production of efficient hybrid, plug-in electric hybrid, plug-in electric drive, and hydrogen fuel cell electric vehicles.	Increase U.S. manufacturing capacity of electric vehicles and supply chain components.	Economic Instrument	Implemented	Transport	CO2, CH4	2022	U.S. Department of Energy	NE	NE
National Park Service Sustainability Programs	Supports efforts to mitigate the effects of climate change and integrate sustainable practices. The NPS Green Parks Plan, Net Zero Strategy and EV Roadmap will provide implementation instructions for EO 14057.	Promote climate mitigation and sustainable practices at national parks.	Economic Instrument, Other	Implemented	Transport; Energy: Residential & Commercial End Use	CO2	2024	U.S. Department of the Interior / National Park Service	NA	NE
National Electric Vehicle Charging Infrastructure Program	The National Electric Vehicle Infrastructure formula program (NEVI) provides nearly $5 billion for states to begin to build out a nationwide EV charging network, with a particular focus on the Interstate Highway System.	Provide funding to states to build out an EV charging network.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation, U.S. Department of Energy	NE	NE
Charging and Fueling Infrastructure Discretionary Grant Program	This discretionary grant program is further divided into two $1.25 billion programs that can help provide EV charging where people live and work: a Corridor Charging Grant Program for charging and	Provide funding for electric vehicle charging infrastructure.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation, U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	fueling infrastructure on Alternative Fuel Corridors, and a Community Charging Grant Program for charging and fueling infrastructure in communities.									
Fueling Aviation's Sustainable Transition (FAST) Grant Program	Inflation Reduction Act program which provides grant funding for certain emissions reduction projects, including $244.5 million for projects relating to the production, transportation, blending, or storage of sustainable aviation fuel and an additional $46.5 million for development, demonstration, and application of low-emission aviation technologies. *This program may influence GHG emissions from international transport.*	Provide grant funding for emissions reduction projects focused on sustainable aviation fuel and other aviation technologies.	Economic Instrument	Implemented	Transport	CO2, N2O, CH4	2022	U.S. Department of Transportation	NE	NE
Anti-Idling Programs	Decreased fuel consumption and greenhouse gas emissions due to reduced wait times and engine idling at the U.S.-Canada border and at U.S. inspection stations.	Reduce GHG emissions from commercial motor vehicles.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O, HFCs	2011	U.S. Department of Transportation	NE	NE
Maritime Environmental and Technical Assistance Program	Supports technology and innovation projects within the maritime sector to provide needed (and often lacking) information on applications to	Reduce GHG emissions from the maritime sector.	Other	Implemented	Transport	CO2, CH4, N2O	2010	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	reduce and mitigate environmental impacts related to air and water quality.									
On-Road GHG Assessment Tools	Supports and encourages State and local governments to estimate future GHG emissions from the on-road portion of the transportation sector and find strategies to mitigate these effects.	Support State and local strategies to reduce GHG emissions from the transportation sector.	Other	Implemented	Transport	CO2, CH4, N2O	2011	U.S. Department of Transportation	NE	NE
Alternative Fuel Corridors Program	Designates Alternative Fuel Corridors in collaboration with State and local partners for electric, hydrogen, natural gas and propane. Publishes corridor maps, information and technical guidance and supports mapping tools in cooperation with the Department of Energy.	Establish a national network of alternative fuel corridors.	Other	Implemented	Transport	CO2, CH4, N2O	2016	U.S. Department of Transportation	NE	NE
Continuous Lower Energy, Emissions and Noise Program	The Continuous Lower Energy, Emissions and Noise (CLEEN) Program is the FAA's principal environmental effort to accelerate the development of new aircraft and engine technologies.	Reduce GHG emissions from the aviation sector.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2010	U.S. Department of Transportation	NE	NE
Carbon Offsetting and Reduction Scheme for	Supports the monitoring, reporting, and verification of CO_2 emissions from international flights pursuant to Annex 16,	Reduce GHG emissions from the aviation sector.	Other	Implemented	Transport	CO2, CH4, N2O	2019	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
International Aviation	Volume IV – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), of the Chicago Convention. *This measure influences GHG emissions from international transport.*									
Next Generation Air Transportation System	Achieves more efficient aircraft operations and reduced GHG emissions through airspace, operational, and infrastructure improvements. This measure may influence GHG emissions from international transport.	Reduce GHG emissions from the aviation sector.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2004	U.S. Department of Transportation	NE	NE
Transit GHG Emissions Estimator Tool	The tool provides a resource to generate coarse but informative estimates of GHG emissions using limited project information and can be used for a broad range of transit projects.	Assist transit agencies with estimating the GHG emissions from transit projects.	Other	Implemented	Transport	CO2, CH4, N2O	2017	U.S. Department of Transportation	NE	NE
Low and No-Emission Component Assessment Program	Supports research for the testing, evaluation, and analysis of low or no emission components intended for use in "LoNo" transit buses to provide public transportation.	Reduce GHG and regulated emissions from transit buses.	Other	Implemented	Transport	CO2, CH4, N2O	2017	U.S. Department of Transportation	NE	NE
Bus Testing Program	Provides information on transit bus GHG and regulated emissions to support FTA-funded transit operators in selecting cleaner and	Reduce GHG and regulated emissions from transit buses.	Regulatory	Implemented	Transport	CO2, CH4, N2O	1989	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	more efficient bus models for their fleets.									
Transportation Decarbonization MOU and Blueprint	On September 15, 2022, the Departments of Transportation, Energy, and Housing and Urban Development and the Environmental Protection Agency signed a Memorandum of Understanding to coordinate an "all-of-government" approach to decarbonizing the transportation sector, in conjunction with non-federal action. This was followed by a Blueprint report, as well as a series of Action Plans which will help to inform steps the federal government can take to decarbonize the sector.	Coordinate cross-agency approach to decarbonizing the transportation sector.	Other	Implemented	Transport	CO2, CH4, N2O, HFCs	2022	U.S. Department of Transportation, U.S. Department of Energy, U.S. Environmental Protection Agency, U.S. Department of Housing and Urban Development	NE	NE
Carbon Reduction Program	Funded by the Bipartisan Infrastructure Law, this program provides $6.4 billion in formula funding for states and localities over five years for a wide range of projects designed to reduce transportation emissions from on-road highway sources.	Provide funding to states and localities to reduce transportation emissions from on-road highway sources.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE
Port Infrastructure	Under the Bipartisan Infrastructure Law, PIDP was expanded to allow for funding for	Encourage seaports to adopt zero-emissions	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2019	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Development Program (PIDP)	electric vehicle charging or hydrogen refueling infrastructure for drayage and medium- or heavy-duty trucks and locomotives that service the port and related grid upgrades. This grant program will provide $2.25 billion over five years to improve port facilities, including projects that will reduce or eliminate toxic air pollutants and greenhouse gas emissions. The Bipartisan Infrastructure Law overall doubles the level of investment in port infrastructure and waterways, helping strengthen our supply chain and reduce pollution.	equipment and conduct decarbonization planning.								
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	Under the Bipartisan Infrastructure Law, CMAQ was expanded to allow for the funding of the purchase of medium- or heavy-duty zero emission vehicles and related charging equipment.	Encourage the purchase of low- and zero-emissions medium- and heavy-duty vehicles.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	1991	U.S. Department of Transportation	NE	NE
The Surface Transportation Block Grant (STBG) Program	STBG was expanded to include eligibility for electric vehicle charging infrastructure and vehicle-to-grid infrastructure.	Provide funding for a wide variety of surface transportation applications, including low- and zero-emissions options.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2016	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Federal Transit Administration (FTA) Low and No Emission Bus Programs	The Bipartisan Infrastructure Law expands this competitive program which provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities.	Encourage the adoption of zero- and low-emission transit buses.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2016	U.S. Department of Transportation	NE	NE
FTA Buses + Bus Facilities Competitive Program	This program provides competitive funding to states and direct recipients to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities including technological changes or innovations to modify low or no emission vehicles or facilities.	Improve existing bus-related facilities, including actions to reduce emissions.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2016	U.S. Department of Transportation	NE	NE
Capital Investment Grants (CIG) Program	The Bipartisan Infrastructure Law guarantees $8 billion, and authorizes $15 billion more in future appropriations, to invest in new high-capacity transit projects communities choose to build, providing more people with clean, convenient, and reliable transit service.	Provide funding for capital investments in transit systems.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2016	U.S. Department of Transportation	NE	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Electric or Low Emitting Ferry Pilot Program	This Bipartisan Infrastructure Law competitive grant program will support the transition of passenger ferries to low or zero emission technologies.	Encourage the adoption of low- and zero-emission passenger ferries.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE
Railroad Rehabilitation and Improvement Financing (RRIF)	The Bipartisan Infrastructure Law program expands eligibility for transit-oriented development in the Railroad Rehabilitation and Improvement Financing (RRIF) loans.	Provide funding for rail improvements, including for transit-oriented development.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2009	U.S. Department of Transportation	NE	NE
Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program	This Bipartisan Infrastructure Law program, administered by the U.S. Department of Transportation's Federal Railroad Administration (FRA), provides funding to replace inefficient locomotives with cleaner alternatives.	Provide funding to improve the safety, efficiency, and reliability of intercity passenger and freight rail.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2015	U.S. Department of Transportation	NE	NE
TIFIA 49 for Transit	The Transportation Infrastructure Finance and Innovation Act (TIFIA) program will begin offering low-cost and flexible financing for transit and Transit-oriented Development (TOD) projects at the maximum level authorized under law. This initiative, established by the Bipartisan Infrastructure Law, "TIFIA 49," authorizes borrowing up to 49% of	Provide financing for transit-oriented development.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	eligible project costs, helping more projects get off the ground. With few exceptions, TIFIA loans have historically been capped at 33% of eligible project costs.									
Transit Oriented Development Pilot	The Pilot Program for TOD Planning provides funding to local communities to integrate land use and transportation planning with a new fixed guideway or core capacity transit capital investment. Comprehensive planning funded through the program must examine ways to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations.	Encourage comprehensive transit-oriented development planning.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O, HFCs	2022	U.S. Department of Transportation	NE	NE
Safe Streets and Roads for All	This Bipartisan Infrastructure Law program provides $5 billion over 5 years directly to local and tribal governments to support their efforts to advance “vision zero” plans and other improvements to	Improve the safety of zero-emissions active transportation options.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O, HFCs	2022	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	reduce crashes and fatalities, especially for cyclists and pedestrians. By making our roadways safer, this program will encourage people to choose active modes of transportation, reducing emissions.									
Transportation Alternatives Program	This Bipartisan Infrastructure Law program provides formula funding to support pedestrian and bike infrastructure, recreational trails, safe routes to school and more, giving more people the option to choose clean active transportation options.	Encourage zero-emissions active transportation options.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O, HFCs	2016	U.S. Department of Transportation	NE	NE
Sustainable Aviation Fuel “Grand Challenge” and Roadmap	DOT, the Department of Energy, and the Department of Agriculture launched the SAF Grand Challenge in 2021, and in September 2022 rolled out a Roadmap to meet the Challenge’s goals of 3 billion gallons of sustainable aviation fuel by 2030 and 35 billion gallons by 2050. This measure may influence GHG emissions from international transport.	Set targets for sustainable aviation fuel and create a roadmap for achieving them.	Other	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation, U.S. Department of Energy, U.S. Department of Agriculture	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Federal Aviation Administration (FAA) Terminal Program	This discretionary grant program funded by the Bipartisan Infrastructure Law will provide $5 billion over five years for airport terminal development and other landside projects. This discretionary grant program will support projects that increase energy efficiency through upgrading environmental systems, upgrading plant facilities, and achieving LEED standards.	Provide grants for airports to increase energy efficiency in terminals.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE
Federal Aviation Administration (FAA) ASCENT Program	This university-led Center of Excellence on sustainable aviation fuels and environment undertakes cutting edge research to advance new technologies, reduce environmental impacts, and develop sustainable fuels. This measure may influence GHG emissions from international transport.	Conduct research on zero- and low-carbon aviation fuels.	Other	Implemented	Transport	CO2, CH4, N2O	2013	U.S. Department of Transportation	NE	NE
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants	RAISE grants support surface transportation projects of local and/or regional significance that can improve the sustainability of our transportation system.	Provide funding for large surface transportation projects that contribute to emissions reductions.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2021	U.S. Department of Transportation	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Reduction of Truck Emissions at Port Facilities Grant Program	This Bipartisan Infrastructure Law program, administered by the Federal Highway Administration (FHWA), provides $400 million in competitive funding to reduce truck idling and emissions at ports, including through the advancement of port electrification.	Provide funding for vehicles and equipment to reduce truck emissions at port facilities.	Economic Instrument	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE
Transit Bus Electrification Tool	This tool allows users to estimate the partial lifecycle greenhouse gas emission savings associated with replacing standard bus fleets with low-emission or zero-emission transit buses.	Assist transit agencies with fleet transition planning.	Other	Implemented	Transport	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE
Corporate Average Fuel Economy (CAFE) Standards	These national standards regulate how far U.S. vehicles must travel on a gallon of fuel, with standards for passenger cars and for light trucks (collectively, light-duty vehicles), and separate fuel consumption standards for medium- and heavy-duty trucks and engines.	Conserve energy by reducing gasoline consumption and save consumers money on fuel costs.	Regulatory	Implemented	Transport	CO2, CH4, N2O	1975	U.S. Department of Transportation	NE	NE
Light-duty and Medium-duty Vehicle GHG Standards	A 2024 rule revised existing GHG vehicle emissions standards to set increasingly more protective year-over-year emissions standards for model years 2027-2032. Builds	Reduce GHG emissions from the light-duty and medium-duty vehicle sectors.	Regulatory	Implemented	Transport	CO2, CH4, N2O, HFCs	2012 (model year)	U.S. Environmental Protection Agency	217,000	600,000

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	upon prior standards first promulgated in 2010 and revised in 2012, 2020, and 2021.									
Heavy-duty Vehicle GHG Standards	A rule finalized in 2024 revises existing GHG emission standards for work trucks, buses, and other heavy-duty vehicles (HDVs) to set increasingly more protective emission standards for model years 2027 through 2032. Builds upon prior sets of GHG emission standards that phased in beginning in 2014 and 2021.	Reduce GHG emissions from the heavy-duty vehicle sector.	Regulatory	Implemented	Transport	CO2, CH4, N2O, HFCs	2014	U.S. Environmental Protection Agency	45,200	171,000
Renewable Fuel Standard	Increases the share of renewable fuels used in transportation via implementation of the Renewable Fuel Standard Program	Increase use of renewable transportation fuels.	Regulatory	Implemented	Transport	CO2, CH4, N2O	2011	U.S. Environmental Protection Agency	NE	NE
Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures	Establishes GHG emission standards for airplanes used in commercial aviation and for large business jets. This action aligns U.S. standards with the international CO_2 emissions standards set by the International Civil Aviation Organization (ICAO). *This measure influences GHG emissions from international transport.*	Reduce GHG emissions from certain classes of aircraft.	Regulatory	Implemented	Transport	CO2	2021	U.S. Environmental Protection Agency, U.S. Department of Transportation – Federal Aviation Administration	NE	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
SmartWay Transport Partnership	Promotes collaboration with businesses and other stakeholders to decrease GHG and other emissions from movement of goods	Reduce GHG emissions from movement of goods.	Other	Implemented	Transport	CO2	2004	U.S. Environmental Protection Agency	9,200	12,000
National Clean Diesel Campaign	Reduces diesel emissions through the implementation of proven emission control technologies	Reduce diesel emissions.	Other	Implemented	Transport	CO2	2008	U.S. Environmental Protection Agency	NE	NE
Light-Duty Vehicle Fuel Economy and Environment Label	Provides comparable information on new LDV fuel economy, energy use, fuel costs, and environmental impacts	Provide information to vehicle buyers.	Regulatory	Implemented	Transport	CO2	2011	U.S. Environmental Protection Agency, U.S. Department of Transportation, U.S. Department of Energy	NE	NE
Federal Fleet Program	Requires federal agencies to acquire low GHG emitting light-duty and medium-duty passenger vehicles	Reduce GHG emissions from the federal vehicle fleet.	Regulatory	Implemented	Transport	CO2	2010	U.S. Environmental Protection Agency	NE	NE
EPA Ports Initiative	Program to reduce emissions from ports and other goods movement hubs through use of community engagement, data and analysis, funding, and information sharing	Reduce GHG and other air pollutant emissions from ports.	Other	Implemented	Transport	CO2	2016	U.S. Environmental Protection Agency	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Clean Ports Program	$3 billion grant program to fund zero-emission port equipment and infrastructure as well as climate and air quality planning at U.S. ports	Reduce GHG and other air pollutant emissions from ports.	Economic Instrument	Adopted	Transport	CO2	2024	U.S. Environmental Protection Agency	NA	NE
Clean Heavy-Duty Vehicles Program	$1 billion grant program to replace existing heavy-duty commercial vehicles (Class 6 and Class 7) currently in use, many of which pre-date recent U.S. EPA emissions standards and disproportionately contribute to GHG and other air pollutant emissions, resulting in harmful health impacts to communities located in and around where these vehicles operate. Grants are provided for replacing internal combustion engine Class 6/7 vehicles with new zero-emission vehicles, including school buses, delivery trucks, utility trucks, and more.	Reduce GHG and other air pollutant emissions from heavy-duty vehicle fleets by replacing existing vehicles with new zero-emission vehicles.	Economic Instrument	Adopted	Transport	CO2	2024	U.S. Environmental Protection Agency	NA	NE
Clean School Bus Program	$5 billion grant program, over five years (FY 2022-2026), to replace existing school buses with zero-emission and clean school buses.	Reduce GHG and other air pollutant emissions from school buses.	Economic Instrument	Implemented	Transport	CO2	2022	U.S. Environmental Protection Agency	NE	NE
Energy: Supply										

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Production Tax Credit for Electricity from Renewables (beginning construction pre-2025)	The Inflation Reduction Act (IRA) extends and modifies the § 45 Production Tax Credit for renewables-based electricity generation. The credit value can increase 5 times if a project meets prevailing wage and registered apprenticeship requirements, with additional bonuses available for domestic content and location in energy communities.	Provide incentive for production of renewable energy.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Clean Electricity Production Tax Credit (2025 onwards)	The IRA provides a technology-neutral production tax credit for clean electricity, replacing the § 45 Production Tax Credit after 2024. The credit value can increase 5 times if a project meets prevailing wage and registered apprenticeship requirements, with additional bonuses available for domestic content and location in energy communities.	Provide incentive for production of clean electricity from net-zero GHG emissions sources.	Economic Instrument	Adopted	Energy: Supply	CO2, CH4	2025	U.S. Department of the Treasury	NA	NE
Investment Tax Credit for Energy Property (pre-2025)	The IRA extends the investment tax credit in renewable energy projects. The credit value can increase 5 times if a project meets	Provide incentive for investment in renewable energy projects.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	prevailing wage and registered apprenticeship requirements, with additional bonuses available for domestic content and location in energy communities.									
Clean Electricity Investment Tax Credit (2025 onwards)	The IRA provides a technology-neutral investment tax credit for clean electricity, replacing the § 48 investment tax credit after 2024. The credit value can increase 5 times if a project meets prevailing wage and registered apprenticeship requirements, with additional bonuses available for domestic content and location in energy communities.	Provide incentive for investment in clean electricity projects that are net-zero GHG emissions sources.	Economic Instrument	Adopted	Energy: Supply	CO2, CH4	2025	U.S. Department of the Treasury	NA	NE
Low-Income Communities Bonus Credit	The IRA provides an additional investment tax credit of 6% for small-scale solar and wind projects on an allocated basis. The credit value increases by 10 percentage points for facilities in low-income communities or tribal lands. The credit value increases by 20 percentage points for projects in federally subsidized housing programs or that offer at least 50% of the financial benefits	Provide incentive for small-scale solar and wind projects in low-income communities or tribal lands.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2023	U.S. Department of the Treasury, U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	of electricity production to low-income households.									
Zero-Emission Nuclear Power Production Credit	The IRA provides a production tax credit of 0.3 cents per kWh (inflation adjusted after 2024) for nuclear electricity generation, phasing down depending on gross receipts from the nuclear facility. The credit value can increase 5 times if a project meets prevailing wage and registered apprenticeship requirements.	Provide incentive for nuclear energy generation.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2024	U.S. Department of the Treasury	NA	NE
Empowering Rural America New ERA Program	Funds construction of electricity distribution, transmission, and generation systems for rural electric cooperatives.	To achieve the greatest reduction in greenhouse gas emissions while advancing the long-term resiliency, reliability, and affordability of rural electric systems.	Economic Instrument	Implemented	Energy: Supply	CO2, N2O, CH4	2022	U.S. Department of Agriculture	NE	51,630
Powering Affordable Clean Energy (PACE) Program	Finance construction of electric generation and storage facilities in rural areas.	To finance projects that generate electricity from renewable energy resources or store electricity in support of renewable energy resources.	Economic Instrument	Implemented	Energy: Supply	CO2, N2O, CH4	2022	U.S. Department of Agriculture	NE	2,100
Electric Loan Program	Provides loans to finance electricity infrastructure to ensure	To provide financial support to modernize and	Economic Instrument	Implemented	Energy: Supply	CO2, N2O	1936	U.S. Department of Agriculture	NE	1,600

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	reliable and affordable electricity to rural communities	expand rural electricity infrastructure.								
Rural Energy for America Program (REAP)	Provides grants and loan guarantees to various rural residents, agricultural producers, and rural businesses for energy efficiency and renewable energy systems.	To stimulate adoption of energy efficiency measures and renewable energy systems.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2008	U.S. Department of Agriculture	4085	7740
Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program	Provides loan guarantees for using renewable biomass to make advanced biofuels, renewable chemicals and biobased products.	To assist in the development, construction and retrofitting of new and emerging technologies.	Economic Instrument	Implemented	Energy: Supply; Energy: Industrial End-Use	CO2, CH4	2010	U.S. Department of Agriculture	68.04	408.23
Advanced Biofuel Payment Program	Incentive payments are made for advanced biofuel produced. Includes cellulosic biofuels, biogas, wood pellets.	To increase the production of advanced biofuels.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2009	U.S. Department of Agriculture	NE	1,510
IRA Energy Infrastructure Reinvestment Financing (Sec 50144)	To guarantee loans to projects that retool, repower, repurpose, or replace energy infrastructure that has ceased operations or that enable operating energy infrastructure to avoid, reduce, utilize, or sequester air pollutants or anthropogenic emissions of greenhouse gases. IRA places a	Finance projects that retool, repower, repurpose, or replace energy infrastructure that has ceased operations or enable operating energy infrastructure to avoid, reduce, utilize or sequester air pollutants or	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NA	66,753

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	total cap on loan guarantees of up to $250 billion and appropriates $5 billion in credit subsidy to support these loans under section 1706 of the Energy Policy Act of 2005.	greenhouse gas emissions.								
IRA Tribal Energy Loan Guarantee Program (Sec 50145)	To support Tribal investment in energy-related projects by providing direct loans or partial loan guarantees to federally recognized Tribes, including Alaska Native villages or regional or village corporations, or a Tribal Energy Development Organization that is wholly or substantially owned by a federally recognized Indian Tribe or Alaska Native Corporation. The Inflation Reduction Act increased the total loan authority from $2 billion to $20 billion and provides $75 million to carry out the program.	The program supports Tribal energy financing for the development of energy resources like solar, wind farms, microgrids, and transmission and distribution.	Economic Instrument	Implemented	Energy: Supply	CO2	2018	U.S. Department of Energy	NA	2,811
BIL Clean Hydrogen Electrolysis Program (Sec 40314)	The Bipartisan Infrastructure Law provides support for research, development, demonstration, and deployment of clean hydrogen production using electrolyzers for commercialization.	Reduce cost of clean hydrogen production.	Other	Implemented	Energy: Supply	CO2, CH4	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
National Community Solar Partnership	Community solar allows community members of all types to access the meaningful benefits of renewable energy, including reduced energy costs, increased resilience, ownership, and wealth building. DOE's community solar target is to power 5 million homes and provide 20% savings on a subscriber's energy bills, up from 10% on average today, by 2025.	Connect Americans to low-cost community solar options.	Other	Implemented	Energy: Supply	CO2, CH4	2019	U.S. Department of Energy	NE	NE
Concentrating Solar Power Gen 3 Particle Pilot Plant (G3P3)	A MW scale integrated pilot facility showcasing particle thermal energy storage and a supercritical CO_2 power cycle at the Sandia National Laboratory's National Solar Thermal Test Facility.	Show an integrated particle and supercritical CO_2 concentrating solar-thermal power system operating at temperatures above 700°C consistent with DOE's 5¢/kWH concentrating solar-thermal power cost reduction target, including 12 hours of long duration energy storage.	Other	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
Interconnection Information e-Xchange (i2X)	The mission of i2X is to develop innovative solutions to enable faster, simpler, and fairer interconnection of clean energy and energy storage, while enhancing the reliability and	Facilitate interconnection of renewable resources and energy storage into the power grid.	Other	Implemented	Energy: Supply	CO2, CH4	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	resilience of our nation's distribution and transmission grid networks. BIL funds launched the program in FY22.									
BIL New Solar Research & Development (Sec 41007)	Funded by the Bipartisan Infrastructure Law to award financial assistance to eligible entities for research, development, demonstration, and commercialization projects to advance new solar energy manufacturing technologies and techniques.	To facilitate a resilient c-Si PV supply chain and advance innovative c-Si PV technologies towards commercialization.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2023	U.S. Department of Energy	NA	NE
BIL Solar Recycling Research & Development (Sec 41007)	Funded by the Bipartisan Infrastructure Law to award financial assistance to eligible entities for research, development, demonstration, and commercialization projects to create innovative and practical approaches to increase the reuse and recycling of solar energy technologies.	To fund R&D related to PV module recycling and designing modules for the end of their life. In addition, these funds are being used to develop an ecosystem of companies and researchers looking to address PV recycling in the United States.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2023	U.S. Department of Energy	NA	NE
BIL Solar Energy Research and Development (Sec 41007)	Funded by the Bipartisan Infrastructure Law to fund research, development, demonstration, and commercialization activities to	This provision was used to fund three separate efforts: - Grid Services funding opportunity: the objective is to demonstrate that	Economic Instrument	Implemented	Energy: Supply	CO2, CH4	2024	U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	improve solar energy technologies.	solar and storage systems can provide support services to grid operators to ensure grid operation with high penetrations of IBRs. - Workforce funding opportunity: the objective is create access to solar energy related job training and job placement support at locations around the country with a focus on under represented populations. - i2x: Facilitate interconnection of renewable resources and energy storage into the power grid.								
BIL Pumped Storage Hydropower Wind and Solar Integration and System Reliability	Funded by the Bipartisan Infrastructure Law to provide financial assistance to eligible entities to carry out project design, transmission studies, power market assessments, and permitting for a pumped storage hydropower project to facilitate	Carry out project design, transmission studies, power market assessments, and permitting for a pumped storage hydropower project to facilitate the long-duration storage of	Economic Instrument	Implemented	Energy: Supply	CO2	2024	U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Initiative (Sec 40334)	the long-duration storage of intermittent renewable electricity.	intermittent renewable electricity.								
BIL Marine Energy Research, Development, and Demonstration (Sec 41006)	Funded by the Bipartisan Infrastructure Law to fund research, development, and demonstration activities to improve marine energy technologies.	Fund research, development, and demonstration activities to improve marine energy technologies.	Economic Instrument	Implemented	Energy: Supply	CO2	2007	U.S. Department of Energy	NE	NE
BIL Hydropower Research, Development, and Demonstration (Sec 41006)	Funded by the Bipartisan Infrastructure Law to fund research, development, and demonstration activities to improve hydropower technologies.	Fund research, development, and demonstration activities to improve hydropower technologies.	Economic Instrument	Implemented	Energy: Supply	CO2	2007	U.S. Department of Energy	NE	NE
BIL National Marine Energy Centers (Sec 41006)	Funded by the Bipartisan Infrastructure Law to provide financial assistance for the establishment of new National Marine Energy Centers and the continuation and expansion of the research, development, demonstration, testing, and commercial application activities at the existing Centers.	Continue and expand research, development, demonstration, testing, and commercial application activities at the existing National Marine Energy Centers.	Economic Instrument	Implemented	Energy: Supply	CO2	2010	U.S. Department of Energy	NE	NE
Offshore Wind Demonstration Projects	Designed to reduce the cost of offshore wind energy through the development and deployment of innovative technologies, in order to develop offshore wind systems	Support the development and deployment of offshore wind energy systems through	Economic Instrument	Implemented	Energy: Supply	CO2	2012	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	ready for commercial operation in U.S. waters. The demonstrations will help address key challenges associated with installing full-scale offshore wind turbines, connecting offshore turbines to the power grid, and navigating new permitting and approval processes.	demonstration project funding.								
BIL Wind Energy Technology Program (Sec 41007)	Funded by the Bipartisan Infrastructure Law to fund research, development, demonstration, and commercialization activities to improve wind energy technologies.	Support a wide range of research and development activities to reduce wind energy costs and improve the conditions for wind energy deployment in the United States.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
BIL Wind Energy Tech Recycling Research & Development (Sec 41007)	Funded by the Bipartisan Infrastructure Law to award financial assistance to eligible entities for research, development, and demonstration, and commercialization projects to create innovative and practical approaches to increase the reuse and recycling of wind energy technologies	Advance innovative and practical approaches to increase the reuse and particularly the recycling of wind energy technologies, including e.g. blades and rare earth magnets.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Methane Emissions Reduction Program	The Inflation Reduction Act established a $1.36 billion financial and technical assistance program to swiftly reduce methane emissions from the oil and gas sector and accelerate the transition to available and innovative oil and gas technologies. This includes funds for activities associated with low-producing conventional wells, methane monitoring, and pollution reduction from oil and gas operations. A GHG emission reduction estimate is provided for the impacts of $350 million in funding announced for 14 states in December 2023 – one portion of the broader Methane Emissions Reduction Program.	Measure and reduce methane emissions from the oil and gas sector.	Economic	Implemented	Energy: Supply	CH4	2024	U.S. Environmental Protection Agency, U.S. Department of Energy -- National Energy Technology Lab	NA	780
BIL Transmission Facilitation Program (Sec 40106)	DOE provides $2.5 billion for the Transmission Facilitation Program (BIL) to enter into capacity contracts with transmission projects in order to facilitate the construction of electric power transmission lines and related facilities. The total amount that DOE is committing for the three	To enable greater clean energy growth and provide low-cost clean energy to more Americans.	Economic Instrument	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	projects (Southline, Cross-Tie, and SWIP-N) selected in the first round of TFP Capacity Contracts as of June 2024, is approximately $1.03 billion.									
BIL Transmission Facilitation Program Public-Private Partnerships Connecting Microgrids (Sec 40106)	In support of the Bipartisan Infrastructure Law, as of June 2024, DOE is reviewing applications for requests for proposals for up to $200 million for transmission projects to connect remote and isolated microgrids to existing infrastructure corridors in Alaska, Hawaii, Hawaii, and the territories of the United States.	Address the unique electric grid configurations and challenges faced by residents in remote and often isolated communities.	Economic Instrument	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE
IRA Transmission Facility Financing (Sec 50151)	Through the Inflation Reduction Act, Congress appropriated $2 billion for the TFF program, which can be used as a credit subsidy to carry out a direct loan program for transmission facility financing for the construction or modification of electric transmission facilities designated by the Secretary to be in the national interest under section 216(a) of the Federal Power Act.	To finance the modification or construction of electric transmission facilities in order to reduce congestion in National Interest Electric Transmission Corridors (NIETCs) as identified in the National Transmission Needs Study.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE

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									Achieved (2022)	Expected (2030)
IRA Transmission Siting and Economic Development (TSED) Grants (Sec 50152)	Through the Inflation Reduction Act, DOE has up to $760 million available to facilitate siting of transmission projects by providing grants to siting authorities to expedite the siting and permitting process and providing grants for economic development activities in communities that may be affected by a transmission project.	Grants to facilitate the siting of interstate electricity transmission lines.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
IRA Interregional and Offshore Wind Electricity Transmission Planning, Modeling and Analysis	A program through the Inflation Reduction Act to conduct transmission planning, modeling, and analysis regarding interregional electricity transmission and transmission of electricity generated by offshore wind and to convene relevant stakeholders to discuss these issues.	Convening decisionmakers and subject matter experts to collect feedback on specific technical solutions and regulatory approaches to facilitate proactive and coordinated offshore wind transmission planning and development.	Other	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
BIL (Energy Policy Act of 2005) Section 243 Hydroelectric Efficiency Improvement Incentives (Sec 40332)	The Bipartisan Infrastructure Law authorized up to $75 million to incentivize upgrades to hydroelectric facilities to increase their efficiency. In February 2024, DOE announced nearly $71.5 million in incentive payments for	For owners or operators of existing hydroelectric facilities, including pumped storage hydropower, to make capital improvements that improve their efficiency by at least 3%. Across	Economic Instrument	Implemented	Energy: Supply	CO2	2005	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	46 hydroelectric facilities selected for negotiations.	selectees, efficiency is expected to increase an average of 14%, nearly five times the mandatory 3% efficiency rate required by the statute.								
BIL (Energy Policy Act of 2005) Section 242 Hydroelectric Production Incentive Program (Sec 40331)	As of June 2024, DOE provides $125 million for Hydroelectric Production Incentives to provide incentive payments to qualified hydroelectric facilities for electricity generated and sold. Hydroelectric facilities, such as those located in communities with inadequate electric service are also eligible to receive incentive payments. In 2014 and 2015, Congress appropriated funds for Hydroelectric Production Incentives under Section 242 of the Energy Policy Act of 2005. In 2021 Congress directed $125 million for the program through the Bipartisan Infrastructure Law. Qualified hydroelectric facilities–existing powered or non-powered dams and conduits that added a new turbine or other hydroelectric generating device–	Supports hydropower development by providing payments for electricity generated and sold from dams and other water infrastructure that add or expand hydroelectric power generating capabilities, or are constructed in an area with inadequate electric service.	Economic Instrument	Implemented	Energy: Supply	CO2	2005	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	may receive up to 1.8 cents per kilowatt hour, indexed for inflation (approximately 2.3 cents per kilowatt hour today) with maximum payments of $750,000 per year for hydroelectric energy generated by the facility during the incentive period.									
BIL (Energy Policy Act of 2005) Section 247 Maintaining and Enhancing Hydroelectricity Incentives (Sec 40333)	As of June 2024, DOE is reviewing applications for up to $554 million for the Maintaining and Enhancing Hydroelectric Incentives program to make incentive payments to the owners or operators of qualified hydroelectric facilities for capital improvements. This investment is made through the Bipartisan Infrastructure Law	Goal is to provide incentive payments to support and enhance existing hydropower facilities through capital improvements related to three main areas: grid resiliency, dam safety, and environmental conditions.	Economic Instrument	Implemented	Energy: Supply	CO2	2005	U.S. Department of Energy	NE	NE
BIL Grid Resilience State and Tribal Formula Grants Program (Sec 40101d)	Authorized through the Bipartisan Infrastructure Law, DOE has $2.3 billion available over five years (FY22-FY26) for States, U.S. Territories, federally recognized Indian Tribes, including Alaska Native Corporations to strengthen and modernize America's power grid against wildfires, extreme weather, and other natural disasters that are exacerbated by	Invest in a diverse set of projects that generate the greatest community benefit providing clean, affordable, and reliable energy and reducing the likelihood and consequences of electrical outages due to wildfires, extreme weather, and other natural disasters	Economic Instrument	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	the climate crisis. The program will distribute funding to states, territories, and federally recognized Indian Tribes, including Alaska Native Regional Corporations and Alaska Native Village Corporations, over five years.	that are exacerbated by the climate crisis.								
BIL Civil Nuclear Credit Program (Sec 40323)	A Bipartisan Infrastructure Law program to help preserve the existing U.S. reactor fleet and save thousands of high-paying jobs across the country.	Owners or operators of commercial U.S. reactors can apply for certification to bid on credits to support their continued operations. An application must demonstrate the reactor is projected to close for economic reasons and that closure will lead to a rise in air pollutants.	Economic Instrument	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE
BIL Grid Resilience and Innovation Partnerships Program (GRIP) (Sec 40103b)	A Bipartisan Infrastructure Law program that is providing Grid Resilience Utility and Industry Grants to support activities that will modernize the electric grid to reduce impacts due to extreme weather and natural disasters; Smart Grid Grants to increase the flexibility, efficiency, and reliability	To enhance grid flexibility and improve the resilience of the power system against growing threats of extreme weather and climate change.	Economic Instrument	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	of the electric power system with a focus on increasing capacity of the transmission system; and the Grid Innovation Program to deploy projects that use innovative approaches to transmission, storage, and distribution infrastructure to enhance grid resilience and reliability.									
Puerto Rico Energy Resilience Fund (PR-ERF)	In December 2022, President Biden signed the FY 2023 Consolidated Appropriations Act into law, which included $1 billion for the establishment of the PR-ERF to drive key investments in renewable and resilient energy infrastructure in Puerto Rico.	To deploy residential solar and battery systems for vulnerable households across Puerto Rico.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
BIL Energy Improvement in Rural or Remote Areas (Sec 40103)	In consultation with the Department of the Interior, to provide financial assistance to improve, in rural or remote areas of the United States, the resilience, safety, reliability, and availability of energy, as well as environmental protection from adverse impacts of energy generation. Created by the BIL	Expand capacity for clean, firm power in rural and remote areas.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
BIL Clean Energy Demonstrations on Current and Former Mine Land (Sec 40342)	To demonstrate the technical and economic viability of carrying out clean energy projects on current and former mine land. Up to five 5 clean energy projects are to be carried out in geographically diverse regions, at least 2 of which shall be solar projects. Created by the BIL	Demonstrate technical and economic clean energy projects on former mine land.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE
BIL Regional Clean Hydrogen Hubs (Sec 40314)	To support the development of at least 4 regional clean hydrogen hubs to improve clean hydrogen production, processing, delivery, storage, and end use. This includes a program to incentivize hydrogen offtake (demand-side program). Created by the BIL.	Stimulate clean hydrogen market lift-off by demonstrating performance at scale.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE
BIL Long-Duration Energy Storage Demonstration Initiative and Joint Program (Sec 41001)	To establish a demonstration initiative composed of demonstration projects focused on the development of long-duration energy storage technologies. Created by the BIL.	Demonstrate long-duration energy storage technologies to incentive commercial uptake of them.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE
BIL Energy Storage Demonstration and Pilot Grant	To enter into agreements to carry out 3 energy storage system demonstration projects. Created by the BIL.	Demonstrate long-duration energy storage technologies to incentive commercial uptake of them.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Program (Sec 41001)										
BIL Advanced Reactor Demonstration Program (Sec 41002)	To fund two large demonstrations of advanced nuclear reactors for electricity generation. The two selected projects are: X-energy in Seadrift, Texas and Terrapower in Kemmerer, Wyoming	Demonstrate advanced nuclear technologies capable of decarbonizing the electricity sector.	Economic Instrument	Implemented	Energy: Supply	CO2, CH4, N2O	2020	U.S. Department of Energy	NE	440
BIL Carbon Capture Demonstration Projects Program (Sec 41004)	To establish a carbon capture technology program for the development of 6 facilities to demonstrate transformational technologies that will significantly improve the efficiency, effectiveness, costs, emissions reductions, and environmental performance of coal and natural gas use, including in manufacturing and industrial facilities. Created by the BIL.	Improve the efficiency, effectiveness, costs, and performance of carbon capture technologies.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
BIL Carbon Capture Large-Scale Pilot Programs (Sec 41004)	To establish a carbon capture technology program for the development of transformational technologies that will significantly improve the efficiency, effectiveness, costs, emissions reductions, and environmental performance of coal and natural gas use, including in	Improve the efficiency, effectiveness, costs, and performance of carbon capture technologies.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	manufacturing and industrial facilities. Created by the BIL									
BIL Regional DAC Hubs (Sec 40308)	To develop four domestic direct air capture hubs that demonstrate a technology or suite of technologies at commercial scale. Created by the BIL	Stimulate carbon capture market lift-off by demonstrating performance at scale.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
Fusion Energy Sciences Research	Develop a fundamental scientific understanding of matter at very high temperatures and densities. This is accomplished through the study of plasmas, the fourth state of matter, and how it interacts with its surroundings.	Enable fusion energy, which could replace other central station electrical power sources which produce carbon.	Other	Implemented	Energy: Supply	CO2	1977	U.S. Department of Energy	NE	NE
Biological and Environmental Research	Foundational research enabling the development of sustainable cellulosic biofuels and bioproducts, stabilization and enhanced storage of carbon in terrestrial ecosystems, and broader understanding of related environmental processes.	Enable development of biofuels, bioproducts, and enhanced carbon storage.	Other	Implemented	Energy: Supply	CO2	2007	U.S. Department of Energy	NE	NE
Basic Energy Sciences Research	Basic chemical and materials sciences research to enable clean hydrogen production, fuels from sunlight, long-term energy storage, etc.	Enable development of clean energy technologies.	Other	Implemented	Energy: Supply	CO2	2010	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Energy Storage R&D	DOE OE National Lab core research for advanced energy storage technology development, testing and validation, safety, analytics, and other areas to support development of energy storage.	Develop advanced energy storage technology.	Economic Instrument	Implemented	Energy: Supply	CO2	2016	U.S. Department of Energy	NE	NE
Funding Opportunity 2867 - LDES Advanced Lithium-ion Demonstrations	2022 DOE-funded lithium-ion battery demonstrations part of the LDES Funding Opportunity 2867. These two selected projects are grid-scale, long-duration, innovative lithium-ion demonstration projects.	Demonstrate innovative energy storage technologies.	Economic Instrument	Implemented	Energy: Supply	CO2	2022	U.S. Department of Energy	NE	NE
Storage Innovations 2030: Technology Liftoff	2023 $15 million funding opportunity to develop research consortia centered around energy storage technologies. Funded consortia target zinc batteries, lead batteries, and flow batteries.	To spur research targeting zinc batteries, lead batteries, and flow batteries.	Economic Instrument	Implemented	Energy: Supply	CO2	2023	U.S. Department of Energy	NA	NE
Demonstration and Validation Funding Opportunity	2023 $15 million funding opportunity to fund innovative energy storage demonstrations. Three demonstration projects were funded: lithium-ion, flow battery, and an advanced long duration energy storage system to support heavy industrial processes.	Demonstrate innovative energy storage technologies.	Economic Instrument	Implemented	Energy: Supply	CO2	2023	U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Microgrid R&D	Provides $8-10 million annually to DOE national labs for conducting applied R&D on microgrids increase the resilience, reliability, and decentralization of electricity delivery infrastructure.	Conduct R&D for the use of microgrids in the integration and operational optimization of distributed energy resources.	Other	Implemented	Energy: Supply	CO2	2017	U.S. Department of Energy	NE	NE
Transformer Resilience and Advanced Components (TRAC) R&D	Conducts basic materials research in advanced conductors for transmission cables; applied materials research to address converter component limitations for high-voltage, high-power applications; and research and development into solid-state power substations converter building blocks that can be used in power flow controllers, solid-state transformers, and solid-state circuit breakers, all of which can help reduce the need for SF6-filled equipment.	Conduct R&D on SF6 alternatives for use as a gaseous dielectric in high-voltage circuit breakers and gas-insulated substations.	Economic Instrument	Implemented	Energy: Supply	SF6	2016	U.S. Department of Energy	NE	NE
IRA Availability of High-Assay Low-Enriched Uranium (HALEU)	To support the High-Assay Low-Enriched Uranium (HALEU) Availability Program activities directed in section 2001 of the Energy Act of 2020, including supporting the establishment of a diverse, market-based supply chain for HALEU. The HALEU	Increase availability of HALEU.	Economic Instrument	Implemented	Energy: Supply	CO2	2023	U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	Availability Program is essential to the demonstration and commercial deployment of advanced reactors, including two demonstration projects that received $2.5 billion in funding through the Bipartisan Infrastructure Law.									
Low Enriched Uranium (LEU) Enrichment Acquisition	The U.S. Department of Energy seeks to buy Low Enriched Uranium (LEU). The purpose of this acquisition is to ensure that, in the event of a supply disruption in the nuclear fuel market, a commercial domestic capacity is available. To accomplish this, DOE intends to acquire LEU from new domestic enrichment capacity to support the commercial availability of LEU for U.S. commercial nuclear energy companies.	Increase availability of United States produced LEU.	Economic Instrument	Implemented	Energy: Supply	CO2	2024	U.S. Department of Energy	NA	NE
Cyber and All-Hazards Resilience for Energy Systems in Transition	Preparedness, RDD&D, and response activities to enhance the cybersecurity and all-hazards resilience of emissions-reducing energy technologies (e.g., distributed energy resources) and enable their secure and resilient	Enable the secure and resilient development, deployment, and operation of emissions-reducing energy technologies.	Other	Implemented	Energy: Supply	CO2	2018	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	integration into existing energy systems.									
Clean Energy Cybersecurity Accelerator	Brings together federal partners, the energy sector, and technology innovators to work jointly to develop and deploy renewable, modern, and secure grid technologies that are cost competitive – ensuring cybersecurity is built into renewable technologies and architectures.	Catalyze the development of new cybersecurity solutions for emissions-reducing energy technologies.	Other	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE
BIL Cybersecurity for the Energy Sector Research, Development, and Demonstration Program	To support development and deployment of advanced cyber applications, technologies, and threat collaboration efforts with the U.S. energy sector.	Enhance security and protect clean energy infrastructure.	Economic Instrument	Implemented	Energy: Supply	CO2	2021	U.S. Department of Energy	NE	NE
Onshore Renewable Energy Development Program	Provides opportunities for and encourages use of federal public lands for the development of wind, solar, and geothermal energy.	Encourage renewable energy development onshore.	Economic Instrument	Implemented	Energy: Supply	CO2	1971	U.S. Department of the Interior	62,839	170,300
Offshore Renewable Energy Program	Advances a sustainable Outer Continental Shelf renewable energy future through site planning and environmentally	Encourage renewable energy development offshore.	Economic Instrument	Implemented	Energy: Supply	CO2	2009	U.S. Department of the Interior	12.53	16,105

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	responsible operations and energy generation.									
Waste Prevention, Production Subject to Royalties, and Resource Conservation	The rule describes the reasonable steps that operators of Federal and Indian oil and gas leases must take to avoid the waste of natural gas and ensure that, when Federal or Indian gas is wasted, the public and Indian mineral owners are compensated through royalty payments.	Reduce the waste of natural gas from venting, flaring, and leaks during oil and gas production activities on Federal and Indian leases.	Regulatory	Implemented	Energy: Supply	CH4	2024	U.S. Department of the Interior	NA	NE
Offshore Fugitive Emissions	Perform fugitive emission monitoring of offshore oil and gas facilities using portable infrared cameras during risk-based air quality compliance inspections and satellite imagery data from NOAA. The program helps identify fugitive sources and facilitate quick remediation.	Reduce fugitive emissions from offshore oil and gas facilities.	Regulatory	Implemented	Energy: Supply	CH4	2010	U.S. Department of the Interior	NE	NE
Orphaned Wells Program	The Department of the Interior's orphaned wells program is led by the Orphaned Wells Program Office (OWPO). The BLM led component of the program, which began in 1976, will continue to inventory, assess, plug, and restore orphaned well sites on Federal lands. The Bipartisan	Reduce or eliminate methane emissions from orphaned onshore and offshore well sites.	Regulatory, Economic Instrument	Implemented	Energy: Supply	CH4	1976	U.S. Department of the Interior	11.8	115.3

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									Achieved (2022)	Expected (2030)
	Infrastructure Law provided $4.7 billion in new funding to support grant programs to States and Tribes for well plugging and clean-up, including funds for methane emissions monitoring at orphaned well sites.									
Offshore Carbon Sequestration Program	The Bipartisan Infrastructure Law amended the OCSLA to authorize DOI to grant leases, easements, or rights-of-way on the OCS for activities that "provide for, support, or are directly related to the injection of a carbon dioxide stream into sub-seabed geologic formations for the purpose of long-term carbon sequestration."	Allows for the storage of carbon dioxide in the sub-seabed of the U.S. outer continental shelf (OCS).	Regulatory	Planned	Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	TBD	U.S. Department of the Interior	NA	NA
Onshore Carbon Sequestration Policy	The Department of the Interior issued a policy enabling the use public lands for site characterization, transportation, injection, capture, and geologic sequestration of carbon dioxide. This includes authorizing rights-of-way and the use of pore space managed by the BLM when surface facilities, including injection wells, are on private or state-owned lands or lands	Allow for the subsurface storage within pore spaces of carbon dioxide on public lands.	Other	Planned	Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	TBD	U.S. Department of the Interior	NA	NA

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									Achieved (2022)	Expected (2030)
	managed by another Federal agency. BLM is engaging in outreach and developing policy for procedures related to authorization.									
Abandoned Mine Land Reclamation Program	The Abandoned Mine Land (AML) Reclamation Program run by the Office of Surface Mining Reclamation and Enforcement (OSMRE) addresses the hazards and environmental degradation posed by legacy coal mines. OSMRE collects a fee assessed on each ton of coal produced, which is then used to fund AML reclamation. The Bipartisan Infrastructure Law invests an additional $11 billion in reclaiming these sites. States with unreclaimed mines on the list of EPA's Abandoned Coal Mine Methane Opportunities Database are encouraged to prioritize the reclamation of such sites in a manner that eliminates methane emissions to the greatest extent possible.	Reclaim abandoned mine lands.	Regulatory, Economic Instrument	Implemented	Energy: Supply	CH4	1977	U.S. Department of the Interior	NE	NE
Federal Air Standards for Oil	New Source Performance Standards (NSPS) and Emissions	Reduce methane (NSPS and EG) and volatile	Regulatory	Implemented	Energy: Supply	CH4	2012	U.S. Environmental	NE	191,000

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
and Natural Gas Sector	Guidelines (EG) regulate methane emissions from the production, processing, transmission, and storage segments of the oil and natural gas sector under Section 111 of the Clean Air Act. The most recent major rulemaking under Section 111, which updated the NSPS and established presumptive standards for the EG, was published in 2024.	organic compound (NSPS only) emissions from the oil and natural gas sector						Protection Agency		
Carbon Pollution Standards for Fossil Fuel-fired Power Plants	Final carbon pollution standards for power plants that set CO_2 limits for new gas-fired combustion turbines and CO_2 emission guidelines for existing coal, oil and gas-fired steam generating units.	Reduce carbon pollution from new and existing power plants.	Regulatory	Implemented	Energy: Supply	CO2	2024	U.S. Environmental Protection Agency	NA	50,000
EPA Green Power Partnership	Encourages and supports U.S. organizations to voluntarily purchase green power to reduce the air pollution and health impacts associated with the use of electricity.	Reduce GHG emissions through green power purchases and use.	Other	Implemented	Energy: Supply	CO2	2001	U.S. Environmental Protection Agency	57,128	68,000
EPA Combined Heat & Power Partnership	Encourages industry to engage and collaborate through EPA's Partner network. The Partnership serves as a resource center for assessing the environmental	Reduce GHG emissions by encouraging energy efficiency.	Other	Implemented	Energy: Supply	CO2	2001	U.S. Environmental Protection Agency	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	impact of thermal and electrical energy use through CHP project development.									
RE-Powering America's Land Initiative	Encourages development of renewable energy on current and formerly contaminated lands, landfills, and mine sites by identifying contaminated lands that might be suitable for renewable energy development and providing technical assistance to communities.	Promote renewable energy on formerly contaminated lands.	Economic Instrument	Implemented	Energy: Supply	CO2	2006	U.S. Environmental Protection Agency	NE	NE
Natural Gas STAR Program & Methane Challenge	Works with oil and natural gas companies to promote proven, cost-effective technologies and practices that improve operational efficiency and reduce methane emissions.	Reduce GHG emissions from oil and natural gas companies.	Other	Implemented	Energy: Supply	CH4	1993	U.S. Environmental Protection Agency	4,780	NA
Coalbed Methane Outreach Program	Voluntary program with the goal of reducing methane emissions from coal mining activities.	Reduce GHG emissions from coal mining.	Other	Implemented	Energy: Supply	CH4	1994	U.S. Environmental Protection Agency	10,970	5,780
Energy: Residential & Commercial End Use										
Energy Efficient Home Improvement Credit	The IRA modifies and extends a 30% tax credit for energy efficiency improvements in residential homes. Up to $600 for qualifying energy property (e.g., heating/cooling equipment), $600	Provide incentive for home energy efficiency improvements.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE

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									Achieved (2022)	Expected (2030)
	for windows, $500 for doors, $2,000 for heat pumps, $1,200 for building envelope improvements. Annual credit total (except for heat pumps) is capped at $1,200.									
Residential Clean Energy Credit	The IRA modifies and extends a 30% tax credit on the purchase of a residential clean energy equipment, added battery storage beginning in 2023.	Provide incentive for purchase of residential clean energy equipment and battery storage.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
New Energy Efficient Home Credit	The IRA provides a tax credit for the construction of new energy efficient homes. Homes meeting Energy Star standards receive a $2,500 credit; zero-energy ready homes receive $5,000. Multifamily residences receive $500/unit for Energy Star standards and $1,000/unit for zero-energy ready.	Provide incentive for construction of new energy efficient homes.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Energy Efficient Commercial Buildings Deduction	The IRA provides a business tax deduction for energy efficiency improvements to commercial buildings, including lighting, heating, cooling, ventilation, and hot water.	Provide incentive for energy efficiency improvements to commercial buildings.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Appliance, Equipment, and Lighting Energy	Establish minimum energy conservation standards for more than 60 categories of appliances, equipment, and lighting.	Establish minimum energy conservation requirements.	Regulatory	Implemented	Energy: Residential & Commercial End Use	CO2, CH4	1987	U.S. Department of Energy	316,800	212,000

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Efficiency Standards										
Building Energy Codes Program	Provides technical assistance supporting cost-effective building energy codes, including model code advancement, as well as state and local code implementation.	Support energy-efficient building codes.	Regulatory	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	1992	U.S. Department of Energy	32,400	46,800
Federal Building Rulemakings (Codes and Clean Energy)	Establish minimum building code standards for Federal buildings along with clean energy standards.	Support the development of more efficient Federal buildings with clean energy uses.	Regulatory	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	1992	U.S. Department of Energy	140	158
Zero Energy Ready Homes (ZERH)	Homes that meet high performance energy efficiency criteria established by DOE may use the Zero Energy Ready Homes label for sales and marketing so that consumers can easily find homes and home builders that build to high performance energy efficient homes. IRA 45L tax credit available for homes that are certified to meet ZERH specifications.	Encourages above code energy energy-efficiency in new homes.	Other	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, HFCs	2013	U.S. Department of Energy	NE	NE
Connected Communities program	The Connected Communities program works to remake buildings into a clean and flexible energy resources by combining energy efficiency and demand	Remake buildings into a clean and flexible energy resources.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs	2019	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	flexibility with smart technologies and communications to inexpensively deliver greater affordability, comfort, productivity, and performance to America's homes and buildings.									
Advanced Building Construction (ABC) Initiative	The U.S. Department of Energy's Advanced Building Construction (ABC) Initiative integrates energy-efficiency solutions into highly productive U.S. construction practices for new buildings and retrofits.	Integrate energy-efficiency solutions into highly productive U.S. construction practices for new buildings and retrofits.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs	2020	U.S. Department of Energy	NE	NE
Initiative for Better Energy, Emissions, and Equity (E3 Initiative)	The E3 Initiative focuses on advancing the research, development, and national deployment of clean heating and cooling systems that include heat pumps, advanced water heaters, low-to-no global warming potential refrigerants, and smarter HVAC diagnostic tools in residential and commercial buildings.	Transform the heating and cooling marketplace, making affordable, clean and efficient solutions easily available across America.	Other	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs	2021	U.S. Department of Energy	NE	NE
Affordable Home Energy Earthshot	Focusing on the challenges facing 50 million U.S. homes in the affordable housing stock, this initiative seeks to accelerate technology innovation and reduce	Reduce the upfront cost of upgrading a home by at least 50% while reducing energy bills by 20% within a decade	Other	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs	Announced 2023	U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	costs to decarbonize existing residential buildings, creating scalable solutions with a focus on multifamily and manufactured homes among other housing types.									
Home Performance with ENERGY STAR	Provides homeowners with resources to identify trusted contractors for high-quality, comprehensive energy audits and residential retrofits.	Encourage energy-efficiency improvements in existing homes.	Other	Implemented	Energy: Residential & Commercial End Use	CO2	2002	U.S. Department of Energy	52,831	68,455
Manufactured Homes Regulatory Program	Establish minimum energy conservation standards for manufactured homes.	Support the development of more-efficient manufactured homes.	Regulatory	Implemented	Energy: Residential & Commercial End Use	CO2, CH4	2022	U.S. Department of Energy	NE	564
Better Buildings Initiative, Better Climate Challenge	Partners working with DOE in the Better Buildings Initiative set ambitious goals and contribute real-world energy, carbon, water, and waste solutions to accelerate our future toward a clean energy economy.	Accelerate the adoption of best practices and proven solutions for reducing energy use, carbon emissions, water use, and waste in buildings throughout the U.S.	Other	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs, SF6	2011	U.S. Department of Energy	28,000	37,000
BIL Cost-effective Codes Implementation for Efficiency and Resilience (Sec 40511)	Funded by the Bipartisan Infrastructure Law, this is a competitive grant program to enable sustained, cost-effective implementation of updated building energy codes to save	Enable sustained, cost-effective implementation of updated building energy codes to save customers money on their energy bills.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	9,400

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	customers money on their energy bills.									
IRA Assistance for Latest and Zero Building Energy Code Adoption	IRA program to provide grants to states or units of local government to adopt updated building energy codes, including the zero energy code.	Support the adoption of the latest building energy codes, including the zero energy code to improve end-use energy efficiency and reduce associated emissions.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2023	U.S. Department of Energy	NA	NE
BIL Building Training and Assessment Centers (Sec 40512)	The Bipartisan Infrastructure Law establishes a grant program for institutions of higher education to establish building training and assessment centers to educate and train building technicians and engineers on implementing modern building technologies.	Enhance performance and reduce emissions and increase uptake of energy conserving technologies in the commercial building sector.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE
BIL Career Skills Training Program (Sec 40513)	The Bipartisan Infrastructure Law establishes a grant program to pay the Federal share of career skills training programs under which students concurrently receive classroom instruction and on-the-job training for the purpose of obtaining an industry-related certification to install energy efficient building technologies.	Provide participants with the necessary skills and industry-recognized certifications required to pursue a career in the energy efficiency industry.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
IRA Home Energy Performance-Based, Whole-House Rebates	An Inflation Reduction Act program to award grants to state energy offices to develop a whole-house energy saving retrofits program that will provide rebates to homeowners and aggregators for whole-house energy saving retrofits.	Improve residential whole-home energy efficiency through rebates based on reduction in energy consumption by 20-35+%.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2023	U.S. Department of Energy	NA	NE
IRA High-Efficiency Electric Home Rebate Program	An Inflation Reduction Act program to award grants to state energy offices and Tribal entities to develop and implement a high-efficiency electric home rebate program.	Assist with electrifying residential home energy systems through point of sale rebates on appliances and electrification improvements.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2023	U.S. Department of Energy	NA	NE
IRA State-Based Home Energy Efficiency Contractor Training Grant Program	The Inflation Reduction Act establishes a grant program to provide financial assistance to states to develop and implement a program to provide training and education to contractors involved in the installation of home energy efficiency and electrification improvements, including improvements eligible for rebates under sections 50121(d) and 50122(d) of the Inflation Reduction Act.	Prepare workers and businesses in every U.S. state and territory to deliver energy efficiency and electrification measures funded through the DOE Home Energy Rebate Programs.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
BIL Energy Auditor Training Grant Program (Sec 40503)	The Bipartisan Infrastructure Law establishes a grant program for States to train individuals to conduct energy audits, or surveys, of commercial and residential buildings.	Energy Auditors trained to conduct energy audits, or surveys, of commercial and residential buildings. After the energy auditors conduct the energy audits, or surveys, the energy auditors can advise on how to reduce energy usage, promote energy efficiency, and offer energy savings to the customer.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE
BIL Weatherization Assistance Program (WAP) (Sec 40551)	Provides funding and technical support to states, U.S. territories, and Tribes, which in turn work with a network of about 700 local agencies to provide trained crews to perform residential weatherization services for income-eligible households. Provides funding and technical support to states, U.S. territories, and Tribes, which in turn work with a network of about 700 local agencies to provide trained crews to perform residential weatherization services for income-eligible households. The	Fund weatherization services for low-income households.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O	1977	U.S. Department of Energy	38.78	80.55

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	Bipartisan Infrastructure Law provided additional funds for this program.									
BIL Energy Efficiency Revolving Loan Fund Capitalization Grant Program (Sec 40502)	The Bipartisan Infrastructure Law establishes the Energy Efficiency Revolving Loan Fund Capitalization Grant program for states to conduct commercial and residential energy audits/retrofits.	Increase the energy efficiency of existing building stock.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs, PFCs	2022	U.S. Department of Energy	NE	NE
BIL Public Schools Program (Sec 40541)	The Bipartisan Infrastructure Law provides competitive grants for energy improvements at public school facilities and other strategic initiatives to prioritize schools with high needs, facilitate substantial additional investment, build enduring capacity in local educational agencies, and scale promising partnership models to improve the energy performance and health outcomes in our nation's schools equitably and efficiently.	Improve energy performance, health, and safety of public k-12 schools.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs	2022	U.S. Department of Energy	NE	NE
BIL Non-Profits Program (Sec 40542)	The Bipartisan Infrastructure Law provides competitive grants and other strategic initiatives to enable non-profit organizations to reduce their energy use and	Improve the efficiency of non-profit buildings.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs	2023	U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	carbon emissions while freeing up funds to serve their mission and communities.									
Choice Neighborhoods Implementation Grants	Grants to public housing authorities to developed mixed income communities with minimum green building standards.	Build new energy efficient public housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	2010	U.S. Department of Housing and Urban Development	NE	NE
Public Housing Mixed Finance	Loans to Public Housing Authorities to build new housing with minimum green building standards.	Build or modernize existing energy efficient public housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1972	U.S. Department of Housing and Urban Development	NE	NE
Energy Performance Contracts	Incentives to public housing authorities to increase energy efficiency of existing public housing through third party energy performance service contracts.	Lower energy consumption in public housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1987	U.S. Department of Housing and Urban Development	NE	NE
Community Development Block Grant – Disaster Recovery (CDBG_DR)	Disaster recovery grants to states or local jurisdictions to rebuild after Presidentially Declared Disasters, minimum energy and green building standards required.	Lower energy use in new housing after disasters.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1992	U.S. Department of Housing and Urban Development	NE	NE
Community Development Block Grants	Grants to localities and states for a wide range of purposes, including infrastructure for new Energy Star certified homes.	Support construction or rehabilitation of energy efficient housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1976	U.S. Department of Housing and	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
(CDBG) - Energy Star								Urban Development		
Home Investment Partnerships (HOME) - Energy Star	Formula grants to local jurisdictions or states to build or renovate homes to energy efficient standards.	Support construction or rehabilitation of energy efficient housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1992	U.S. Department of Housing and Urban Development	NE	NE
Housing Trust Fund – Energy Star	Formula grants to local jurisdictions or states to build or renovate homes to energy efficient standards.	Support construction or rehabilitation of energy efficient housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	2008	U.S. Department of Housing and Urban Development	NE	NE
Supportive Housing for the Elderly/ Persons with Disabilities (Secs 202-811)	Competitive grants to build or renovate housing for the elderly or persons with disabilities, with minimum energy standards and incentives for above-code energy standards.	Support construction or rehabilitation of energy efficient housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1959	U.S. Department of Housing and Urban Development	NE	NE
Energy Efficient Mortgages	Single family mortgages for energy efficient existing homes.	Support construction or rehabilitation of energy efficient housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1992	U.S. Department of Housing and Urban Development	NE	NE
Section 203(k) Mortgages	Purchase-rehab mortgages for energy efficient single-family homes.	Support rehabilitation of energy efficient housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	1978	U.S. Department of Housing and Urban Development	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Minimum Energy Standards	Adoption of minimum energy standards for certain HUD-financed or assisted properties (2021 IECC and ASHRAE 90.1-2019) as required by statute.	Support new construction of energy efficient housing.	Regulatory	Implemented	Energy: Residential & Commercial End Use	CO2	2024	U.S. Department of Housing and Urban Development	NA	1,059
Green and Resilient Retrofit Program (IRA 3002)	Provides $1 billion for (i) grants and loans to improve energy efficiency and climate resilience of HUD-assisted multifamily properties, including enhanced air quality, zero-emission electricity generation, building electrification and use of low-emission building materials; and (ii) conduct energy and water benchmarking of HUD-assisted multifamily properties.	Support energy efficient rehabilitation of multifamily housing.	Economic Instrument	Implemented	Energy: Residential & Commercial End Use	CO2	2023	U.S. Department of Housing and Urban Development	NA	NE
Multifamily Better Buildings Challenge and Better Climate Challenge	Voluntary initiative in partnership with DOE to lower energy use and carbon emissions in multifamily housing.	Support energy efficient construction, rehabilitation or operation of energy efficient housing.	Other	Implemented	Energy: Residential & Commercial End Use	CO2, CH4, N2O, HFCs, SF6	2012	U.S. Department of Housing and Urban Development	NE	NE
HUD Climate Action Plan	Departmentwide Action Plan to lower carbon emissions and increase climate resilience in HUD-financed housing.	Support construction, rehabilitation or operation of energy efficient housing.	Other	Implemented	Energy: Residential & Commercial End Use	CO2	2021	U.S. Department of Housing and Urban Development	NE	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Build for the Future Funding Navigator	Searchable listing of funding opportunities under the Inflation Reduction Act (IRA), Bipartisan Infrastructure Law (BIL), and to support efforts to enhance climate resiliency, energy efficiency, renewable energy integration, healthy housing, workforce development and environmental justice in HUD supported communities, programs and properties.	Support construction, rehabilitation or operation of energy efficient housing.	Other	Implemented	Energy: Residential & Commercial End Use	CO2	2023	U.S. Department of Housing and Urban Development	NE	NE
Greenhouse Gas Reduction Fund -- National Clean Investment Fund	$14 billion grant program that establishes national clean financing institutions that deliver accessible, affordable financing for clean technology projects nationwide, partnering with private-sector investors, developers, community organizations, and others to deploy projects and mobilize private capital at scale, with a focus on investment in low-income and disadvantaged communities.	Reduce GHG emissions in low-income and disadvantaged communities through accessible, affordable financing of clean energy investments.	Economic Instrument	Implemented	Energy: Residential and Commercial End-Use; Energy; Supply	CO2	2023	U.S. Environmental Protection Agency	NA	NE
Greenhouse Gas Reduction Fund -- Solar for All	$7 billion grant program that creates new or expands existing low-income solar programs,	Reduce GHG emissions in low-income and disadvantaged	Economic Instrument	Implemented and Ongoing	Energy: Residential and	CO2	2023	U.S. Environmental	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	enabling over 900,000 households in low-income and disadvantaged communities to benefit from distributed solar energy by deploying 4 GW of residential roof-top solar capacity.	communities by expanding deployment of rooftop solar systems.			Commercial End-Use; Energy: Supply			Protection Agency		
ENERGY STAR Products	Products that earn the ENERGY STAR label are independently certified to meet strict standards for energy efficiency set by the EPA.	Reduce GHG emissions through energy-efficient products.	Other	Implemented	Energy: Residential and Commercial End-Use	CO2	1992	U.S. Environmental Protection Agency	194,213	266,000
ENERGY STAR Commercial Buildings	ENERGY STAR tools and resources help businesses determine the most cost-effective approach to managing energy use in their buildings —enabling the private sector to save energy, increase profits, and boost competitiveness.	Reduce GHG emissions from U.S. commercial building operations.	Other	Implemented	Energy: Commercial End-Use	CO2	1993	U.S. Environmental Protection Agency	133,000	141,000
ENERGY STAR Residential New Construction	Promotes improvement in energy performance in residential buildings beyond the labeling of products.	Reduce GHG emissions through energy-efficient new homes and apartments.	Other	Implemented	Energy: Residential End-Use	CO2	1995	U.S. Environmental Protection Agency	4,284	6,700
Energy: Industrial End Use and Industrial Processes and Product Use										
IRA Advanced Industrial Facilities Deployment Program	To provide competitive financial support to owners and operators of facilities engaged in energy intensive industrial processes to complete demonstration and	Reduce emissions associated with industry by providing demonstration projects	Economic Instrument	Implemented	Energy: Industrial End-Use; Industrial Processes	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	deployment projects that reduce a facility's greenhouse gas emissions through installation or implementation of advanced industrial technologies and early-stage engineering studies to prepare a facility to install or implement advanced industrial technologies. Created by the IRA.	for emissions reduction technologies.			and Product Use					
BIL Industrial Emission Demonstration Projects (Sec 41008)	To fund demonstration projects that test and validate technologies that reduce industrial emissions. Created by the BIL.	Reduce emissions associated with industry by providing demonstration projects for emissions reduction technologies.	Economic Instrument	Implemented	Energy: Industrial End-Use; Industrial Processes and Product Use	CO2, CH4, N2O	2022	U.S. Department of Energy	NE	NE
Industrial Decarbonization RD&D	A multi-year RD&D program on sector-specific and crosscutting decarbonization technologies to increase energy efficiency and reduce GHG emissions in the U.S. industrial sector.	Develop and technically validate cost-competitive technologies that, if deployed, will reduce GHG emissions from the industrial sector.	Other	Implemented	Energy: Industrial End-Use; Industrial Processes and Product Use	CO2, CH4, N2O, HFCs	2021	U.S. Department of Energy	NE	NE
Superior Energy Performance/ISO 50001	Encourages the implementation of strategic energy management systems that align to the ISO 50001 standard. Provides guidance, tools and protocols to facilitate energy efficiency savings,	Reduce energy consumption and scope 1 and 2 carbon emissions in the manufacturing sector.	Other	Implemented	Energy: Industrial End-Use	CO2, CH4, N2O, HFCs	2011	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	decarbonization, and improved energy performance.									
Critical Materials Innovation Hub	R&D aims to advance novel, cost-effective, environmentally benign methods to produce critical materials.	Reduce environmental/emissions impacts associated with critical materials production.	Other	Implemented	Energy: Industrial End-Use; Industrial Processes and Product Use	CO2	2018	U.S. Department of Energy	0.006	10.47
Onsite Energy Deployment Program	Provide screening assessments for clean onsite energy systems to identify cost-effective opportunities for manufacturers to supply their own energy.	Reduce energy consumption from large energy users.	Economic Instrument	Implemented	Energy: Industrial End-Use	CO2, CH4, N2O	2004	U.S. Department of Energy	NE	NE
Better Plants, Better Climate Challenge	Industrial partners working with DOE in the Better Plants program and the Better Climate Challenge program set ambitious goals and contribute real-world energy, carbon, water, and waste solutions to accelerate our future toward a clean energy economy.	Reduce energy consumption, GHG emissions, water consumption, and waste in the manufacturing sector.	Other	Implemented	Energy: Industrial End-Use; Industrial Processes and Product Use	CO2, CH4, N2O	2011	U.S. Department of Energy	55,000	67,000
Industrial Assessment Centers (IACs)	Provide energy assessments to small and medium sized manufacturers and make energy efficiency, carbon reduction, water efficiency, and waste reduction recommendations.	Encourage energy efficiency in small and medium manufacturers.	Economic Instrument	Implemented	Energy: Industrial End-Use; Industrial Processes and Product Use	CO2, CH4, N2O, HFCs	1976	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
BIL Industrial Research and Assessment Centers (Sec 40521 b1)	A Bipartisan Infrastructure Law program to provide funding for community colleges, trade schools, and union training programs to create new industrial assessment centers at community colleges, trade schools, and union training programs to expand access to energy- and manufacturing-related career pathways while providing hands-on support to small and medium manufacturers.	Train the clean energy manufacturing workforce and assist small and medium manufacturers across supply chains.	Economic Instrument	Implemented	Energy: Industrial End Use; Industrial Processes and Product Use	CO2, CH4, N2O, HFCs	2021	U.S. Department of Energy	NE	NE
BIL Industrial Research and Assessment Center Implementation Grants (Sec 40521 b3)	A Bipartisan Infrastructure Law program to fund upgrades for small- and medium-sized manufacturers that have been recommended in an assessment from an Industrial Assessment Center, Combined Heat and Power Technical Assistance Partnership, or an approved third-party performing an equivalent assessment.	Improve efficiency, reduce emissions in small and medium sized manufacturers.	Economic Instrument	Implemented	Energy: Industrial End-Use	CO2, CH4, N2O, HFCs	2021	U.S. Department of Energy	NE	NE
BIL State Manufacturing Leadership Program (Sec 40534)	A Bipartisan Infrastructure Law program to provide funding to States to provide assistance to small and medium manufacturers to invest in smart manufacturing	Assist small and medium sized manufacturers through states to adopt smart manufacturing to improve efficiency.	Economic Instrument	Implemented	Energy: Industrial End-Use; Industrial Processes	CO2, CH4, N2O, HFCs	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	technologies or access high-performance computing resources for manufacturing analysis.				and Product Use					
ReX Before Recycling Prize	Prize aimed at building out supply chains for reuse, repair, remanufacturing, repurposing, and refurbishing products and materials.	Building out supply chains for reuse, repair, remanufacturing, repurposing, and refurbishing products and materials.	Other	Implemented	Industrial Processes and Product Use	CO2	2023	U.S. Department of Energy	NA	NE
Circular Economy Demonstration R&D	RD&D projects that will demonstrate at the pilot scale recycling processes for a variety of materials, including plastics, e-scrap, metals, and glass.	To demonstrate at the pilot scale recycling processes for a variety of materials including plastics, e-scrap, metals, and glass.	Other	Implemented	Industrial Processes and Product Use	CO2	2022	U.S. Department of Energy	NE	NE
Carbon Capture Program	Partners with National Laboratories, universities and industry on RDD&D to be applied to a wide variety of sources such as power plants, cement and steel facilities, refineries, petrochemical facilities, and other sources. Research, development, demonstration, and deployment (RDD&D) is focused on adapting technologies or making them robust enough to capture greater than 95% of the CO_2 emissions from these wide variety of sources	Conduct pre-, post-, and oxy-combustion capture RDD&D on transformational gas separation technologies that can help achieve decarbonization goals.	Other	Implemented	Industrial Processes and Product Use; Energy: Industrial End-Use	CO2	2002	U.S. Department of Energy	1210	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	including FEED studies for power and industrial facilities.									
CO2 Utilization	Partners with industry, National Laboratories and academia for CO_2 conversion to fuels, organic and inorganic chemicals, food and feeds, construction materials, energy storage, wastewater treatment, and others.	Advance CO_2 utilization technologies that have the potential to develop additional markets for CO_2 based-products.	Other	Implemented	Industrial Processes and Product Use; Energy: Industrial End-Use	CO2	2015	U.S. Department of Energy	NE	NE
BIL Carbon Utilization Program (Sec 40302)	A Bipartisan Infrastructure Law program to establish a grant program for state and local governments to procure and use products derived from captured carbon oxides, and to invest in additional R&D activities to lower costs and prove technologies.	Launch the Carbon Utilization Procurement Grants Program.	Economic Instrument	Implemented	Industrial Processes and Product Use; Energy: Industrial End-Use	CO2	2021	U.S. Department of Energy	NE	NE
BIL Carbon Dioxide Transportation Infrastructure Finance and Innovation Program (Sec 40304)	BIL program to establish and carry out a carbon dioxide transportation infrastructure finance and innovation program.	Provide access to capital for large-capacity, common-carrier CO_2 transport projects	Economic Instrument	Implemented	Industrial Processes and Product Use; Energy: Industrial End-Use	CO2	2021	U.S. Department of Energy	0	35,357
Advanced Manufacturing Research	Basic chemical and materials sciences research to enable decarbonization of industrial manufacturing processes.	Enable decarbonization of industrial manufacturing processes.	Other	Implemented	Industrial Processes and Product Use	CO2	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Low Carbon Transportation Materials Program	The Bipartisan Infrastructure Law program, administered by the Department of Transportation's Federal Highway Administration, provides $2 billion in grant funding for low carbon materials that create less pollution by reducing the levels of embodied greenhouse gas emissions, including concrete (and cement), glass, asphalt mix, and steel.	Provide funding for low-carbon materials in transportation infrastructure projects.	Economic Instrument	Implemented	Industrial Processes and Product Use; Energy: Industrial End Use	CO2, CH4, N2O	2022	U.S. Department of Transportation	NE	NE
ENERGY STAR for Industry	Partners with manufacturers to reduce CO_2 emissions, develop long-term decarbonization strategies, and provide performance measurement tools.	Reduce GHG emissions from U.S. manufacturing.	Other	Implemented	Energy: Industrial End-Use	CO2	2001	U.S. Environmental Protection Agency	36,760	43,000
The American Innovation and Manufacturing Act (AIM Act)	Establishes phasedown of HFC production and consumption through allowance allocations; establishes regulations to reduce HFC emissions and increase reclamation of existing substances; establishes restrictions on subsectors to effect transition to alternatives.	Phase down HFC production and consumption; maximize reclamation and minimize releases of HFCs and their substitutes; facilitate sector-based transitions to next-generation technologies.	Regulatory	Implemented	Industrial Processes and Product Use	HFCs	2022	U.S. Environmental Protection Agency	29,886	146,096
Significant New Alternatives Policy Program	Facilitates smooth transition away from ozone-depleting chemicals in industrial and consumer sectors.	Transition away from ozone-depleting chemicals.	Regulatory	Implemented	Industrial Processes and Product Use	HFCs, PFCs, SF6	1990	U.S. Environmental Protection Agency	383,272	480,020

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
GreenChill Advanced Refrigeration Partnership	Reduces ozone-depleting and GHG refrigerant emissions from supermarkets through data collection, benchmarking, collaboration, and information sharing on technologies and practices to reduce emissions.	Reduce ozone-depleting and GHG emissions from supermarkets.	Other	Implemented	Industrial Processes and Product Use	HFCs	2007	U.S. Environmental Protection Agency	11,577	18,403
Responsible Appliance Disposal Program	Reduces emissions of refrigerant and foam-blowing agents from end-of-life appliances.	Reduces emissions from end-of-life appliances.	Other	Implemented	Industrial Processes and Product Use	HFCs	2006	U.S. Environmental Protection Agency	46	128
Voluntary Code of Practice for the Reduction of Emissions of HFC and PFC Fire Protection Agents	Minimizes non-fire emissions of HFCs and PFCs used as fire-suppression alternatives, and protects people and property from the threat of fire using proven, effective products and systems.	Reduces GHG emissions from fire protection agents.	Other	Implemented	Industrial Processes and Product Use	HFCs, PFCs	2002	U.S. Environmental Protection Agency	NE	NE
SF_6 Emission Reduction Partnership for Electric Power Systems	Collaborative effort between EPA and the electric power industry to identify, recommend, and implement cost-effective solutions to reduce SF_6 emissions.	Reduce GHG emissions from electricity transmission and distribution.	Other	Implemented	Industrial Processes and Product Use	SF6	1999	U.S. Environmental Protection Agency	500	1,120
Agriculture										
Conservation Reserve Program (CRP)	In exchange for a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and	To remove environmentally sensitive land from agricultural production and plant species that will improve	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	1985	U.S. Department of Agriculture	29,940	18,862

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	plant species that will improve environmental health and quality. Contracts for land enrolled in CRP are 10-15 years in length. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat.	environmental health and quality.								
Environmental Quality Incentives Program (EQIP)	Provides financial and technical assistance to agricultural producers and non-industrial forest managers to address natural resource concerns and deliver environmental benefits.	To work with agricultural producers to plan and implement conservation practices on working lands that deliver cleaner air and water, healthier soil and better wildlife habitat.	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	1996	U.S. Department of Agriculture	17,834	23,500
Conservation Stewardship Program (CStP)	Helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resource concerns and deliver environmental benefits.	To work with agricultural producers to enhance existing conservation efforts and strengthen production operations on working lands.	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	2014	U.S. Department of Agriculture	2,213	2,500
Agricultural Conservation Easement Program (ACEP)	Provides financial and technical assistance to help conserve working agricultural lands and wetlands and their related benefits. The Agricultural Land	To protect croplands and grasslands on working farms and ranches by limiting non-agricultural	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	1990	U.S. Department of Agriculture	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	Easements component helps Indian Tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. The Wetlands Reserve Easements component helps to restore, protect and enhance enrolled wetlands and adjacent lands. Over 5 million acres enrolled.	uses of the land through conservation easements.								
Regional Conservation Partnership Program (RCPP)	Promotes coordination of USDA conservation activities with partners that offer value-added contributions to expand our collective ability to address on-farm, watershed, and regional natural resource concerns. Seeks to co-invest with partners to implement projects that demonstrate innovative solutions to conservation challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address.	To promote conservation partnerships that expand USDA's ability to address on farm, watershed, and regional natural resource concerns.	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	2014	U.S. Department of Agriculture	326	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Conservation Innovation Grants (CIG)	Supports the development of new tools, approaches, practices, and technologies to further natural resource conservation on private lands. Through creative problem solving and innovation, CIG partners work to address our nation's water quality, air quality, soil health and wildlife habitat challenges, all while improving agricultural operations.	To support the development of new tools, approaches, practices, and technologies to further natural resource conservation on private lands.	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	2003	U.S. Department of Agriculture	NE	NE
Conservation Technical Assistance Program (CTA)	Provides our nation's farmers, ranchers and forestland owners with the knowledge and tools they need to conserve, maintain and restore the natural resources on their lands and improve the health of their operations for the future.	To conserve, maintain and restore the natural resources on working lands.	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	1935	U.S. Department of Agriculture	8,014	NE
Partnerships for Climate-Smart Commodities	Supports a diverse range of farmers, ranchers, and private forest landowners, including small and underserved producers, to leverage the greenhouse gas benefits of climate-smart commodity production, provide direct, meaningful benefits to production agriculture, and expand markets for America's climate-smart commodities.	To provide technical and financial assistance to implement climate-smart production practices; to pilot innovative and cost-effective methods for quantification, monitoring, reporting and verification of GHG impacts; and to develop and promote markets and	Economic Instrument	Implemented	Agriculture	CO2, N2O, CH4	2023	U.S. Department of Agriculture	NE	5,834

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
		promote markets for climate-smart commodities.								
USDA Climate Hubs	Support foresters, farmers, ranchers, and rural communities with science-based, region-specific information and technologies that enable climate-informed decision-making and provide assistance to implement those decisions.	Communicate research and facilitate learning on land management practices for resilience and reduce emissions from working lands.	Other	Implemented	Agriculture	CO2, N2O, CH4	2014	U.S. Department of Agriculture	NE	NE
AgSTAR	Encourages the use of methane recovery technologies at confined animal feeding operations that manage manure as liquids or slurries.	Reduce GHG emissions using biogas recovery.	Other	Implemented	Agriculture	CH4	1994	U.S. Environmental Protection Agency	3,790	12,060
LULUCF										
Forest Legacy Program (FLP)	Provides grants to states for fee purchase or conservation easements for high value forests from private landowners.	To encourage the protection of privately owned forest lands through conservation easements or land purchases.	Economic Instrument	Implemented	LULUCF	CO2	1991	U.S. Department of Agriculture—Forest Service	NE	NE
Collaborative Forest Landscape Restoration Program	The purpose of the Collaborative Forest Landscape Restoration Program (CFLRP) is to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes.	To encourage the collaborative, science-based ecosystem restoration of priority forest landscapes.	Economic Instrument	Implemented	LULUCF	CO2	2009	U.S. Department of Agriculture—Forest Service	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Forest Health	Provides technical and financial assistance to prevent, suppress, and control outbreaks of forest insect, disease, and invasives threatening forest resources.	To maintain, enhance, and restore healthy forest conditions.	Economic Instrument	Implemented	LULUCF	CO2	1978	U.S. Department of Agriculture—Forest Service	NE	NE
Community Forest Program (CFP)	Provides grants to match funds with municipal, tribal, or NGO partners for fee purchase of forests to benefit communities.	To establish community forests that provide community benefits.	Economic Instrument	Implemented	LULUCF	CO2	2013	U.S. Department of Agriculture—Forest Service	NE	NE
Forest Stewardship Program (FSP)	Partners with state forestry agencies, cooperative extension, and conservation districts to connect private landowners with the resources needed to manage forests and woodlands and develop stewardship plans.	To enhance and sustain multiple forest resources and contribute to healthy and resilient landscapes.	Economic Instrument	Implemented	LULUCF	CO2	1991	U.S. Department of Agriculture—Forest Service	NE	NE
Great American Outdoors Act (GAOA) (Legacy Restoration Fund and Land and Water Conservation Fund)	GAOA provides permanent full funding for the Land and Water Conservation Fund (LWCF) and establishes a new National Parks and Public Land Legacy Restoration Fund (LRF) to address the deferred maintenance backlog for 5 federal agencies over the next 5 years.	To increase investments in recreation infrastructure, public lands access, and land and water conservation.	Economic Instrument	Implemented	LULUCF	CO2	2020	U.S. Department of Agriculture—Forest Service	NE	NE
Joint Chiefs' Landscape Restoration Partnership	USDA's Forest Service and Natural Resources Conservation Service are working together to improve the health of forests where public	To collaborate with agricultural producers and forest landowners to invest in conservation and	Economic Instrument	Implemented	LULUCF	CO2	2014	U.S. Department of Agriculture—Forest Service	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	forests and grasslands connect to privately owned lands: restoring landscapes, reducing wildfire threats to communities and landowners, protecting water quality and enhancing wildlife habitat.	restoration at large, landscape scale.								
Landscape Scale Restoration (LSR)	Provides grants to further multiple jurisdiction priorities identified in State Forest Action Plans.	To promote collaborative, science-based restoration of priority forest landscapes.	Economic Instrument	Implemented	LULUCF	CO2	2009	U.S. Department of Agriculture—Forest Service	NE	NE
Sustainable Forestry and African American Land Retention Program (SFLR)	Partners with local, state, and other federal agencies to provide resources to assist landowners in local needs, estate planning, and sustainable forestry across the Southern Region.	To address declining African-American rural land holdings, under-participation in sustainable forest management, and heirs' property issues.	Economic Instrument	Implemented	LULUCF	CO2	2013	U.S. Department of Agriculture—Forest Service	NE	NE
Urban and Community Forestry (UCF) Program	Provides financial and technical assistance to state and local agencies to improve understanding and management of urban tree cover and communities and manage the Challenge Cost Share Grant.	To ensure a resilient and equitable tree canopy where more than 84% of Americans live.	Economic Instrument	Implemented	LULUCF	CO2	2013	U.S. Department of Agriculture—Forest Service	NE	NE
Wood Innovations Program	Provides technical assistance and funding to foster the introduction and expansion of wood uses in the economy, including expanding the	To expand and create markets for wood products and wood energy that support long-	Economic Instrument	Implemented	LULUCF	CO2	2015	U.S. Department of Agriculture—Forest Service	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	use of wood energy and the use of advanced wood products, such as incorporation of byproducts of ecosystem restoration projects in long-lived products.	term, sustainable management of forest lands.								
Forest ecosystem restoration and hazardous fuels reduction programs	Restores the health of the nation's forests, woodlands, and rangelands.	To restore resilient, healthy forest conditions and reduce the risk of wildfire.	Economic Instrument	Implemented	LULUCF	CO2	2003	U.S. Department of Agriculture—Forest Service	NE	NE
Healthy Forest Reserve Program	Helps landowners restore, enhance and protect forestland resources on private lands through easements and financial assistance. Through HRFP, landowners promote the recovery of endangered or threatened species, improve plant and animal biodiversity and enhance carbon sequestration.	To restore, enhance and protect forestland resources on private lands.	Economic Instrument	Implemented	LULUCF	CO2	2003	U.S. Department of Agriculture—Forest Service	NE	NE
Waste Management										
Community Technical Assistance for Wastewater and Wet Waste	Provide technical assistance from the National Laboratories to municipalities to enable them to effectively deploy fuel generation technologies as a part of waste treatment.	Enable municipalities to effectively manage wastewater and wet waste.	Other	Implemented	Waste Management	CO2, CH4	2019	U.S. Department of Energy	NE	NE
Standards for New Sources and	Requires owner and operators of new landfills to capture and	Reduce GHG emissions at landfills.	Regulatory	Implemented	Waste Management	CH4	2016	U.S. Environmental	NE	317,744

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
Emission Guidelines for Existing Sources–Landfills	control emissions from landfills including methane and requires states to develop rules updating requirements for existing and fills to capture and control emissions from landfills including methane.							Protection Agency		
Landfill Methane Outreach Program	Reduces GHG emissions at landfills by supporting the recovery and use of landfill gas for energy.	Reduce GHG emissions at landfills.	Other	Implemented	Waste Management	CH4	1994	U.S. Environmental Protection Agency	20,000	20,460
Cross-Cutting										
Executive Order 14057: Catalyzing Clean Energy Industries and Jobs through Federal Sustainability	Executive Order 14057 directs the Federal government to achieve five ambitious goals to reduce emissions across Federal operations: 100% carbon pollution-free electricity by 2030, at least half of which will be locally supplied clean energy to meet 24/7 demand; 100% zero-emission vehicle acquisitions by 2035, including 100% zero-emission light-duty vehicle acquisitions by 2027; Net-zero emissions from Federal procurement no later than 2050, including a Buy Clean policy to promote use of construction materials with lower embodied	Lead by example, catalyze private sector investment, and expand the economy and American industry by transforming how we build, buy, and manage electricity, vehicles, buildings, and other operations to be clean and sustainable.	Regulatory	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End Use; Energy: Industrial End Use; Industrial Processes and Product Use	All	2021	Office of the Federal Chief Sustainability Officer, multiple federal agencies	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	emissions; A net-zero emissions building portfolio by 2045, including a 50% emissions reduction by 2032; and Net-zero emissions from overall federal operations by 2050, including a 65% emissions reduction by 2030.									
Federal Buy Clean Initiative	The Federal Government is prioritizing the use of lower-carbon construction materials in Federal procurement and Federally funded projects.	Mainstream the availability and utilization of low-embodied carbon construction materials.	Other	Implemented	Transport; Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	2022	Office of the Federal Chief Sustainability Officer, multiple federal agencies	NE	NE
Clean Hydrogen Production Tax Credits	The IRA provides up to $3/kg for the production of clean hydrogen at a qualifying production facility. This upper bound includes the bonus credit amount for meeting prevailing wage and apprenticeship requirements. *This will reduce GHG emissions from international transport.*	Provide incentive for production of clean hydrogen.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Residential & Commercial End Use; Energy: Industrial End Use; Industrial	CO2, CH4	2023	U.S. Department of the Treasury	NA	NE

Annex 1: Summary Table of Actions, Polices, and Measures

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
					Processes and Product Use; Agriculture; Waste Management					
Credit for Carbon Oxide Sequestration	The IRA provides a credit of $17 per ton of carbon dioxide captured and sequestered ($36 per ton carbon dioxide for direct air capture); $12 per ton of carbon dioxide injected for enhanced oil recovery ($26 per ton carbon dioxide for direct air capture). The credit value increases 5 times for projects meeting prevailing wage and apprenticeship requirements.	Provide incentive for projects that capture or sequester carbon dioxide.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	Amended in 2022 by IRA	U.S. Department of the Treasury	NA	NE
Advanced Energy Project Credit	The IRA provides a 6% allocated investment tax credit for qualifying advanced energy projects that lead to (i) the production or recycling of clean energy technologies, (ii) reductions in greenhouse gas emissions in industrial facilities, (iii) processing, refining, or recycling of critical minerals. The credit value increases to 30% if a	Provide incentive for industrial or manufacturing advanced energy projects.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use; Waste Management	CO2, CH4	2023	U.S. Department of the Treasury, U.S. Department of Energy	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	project meets prevailing wage and apprenticeship requirements.									
Advanced Manufacturing Production Credit	The IRA provides a per-unit tax credit for domestic manufacturing of components for solar, wind, inverters, battery components, and critical minerals.	Provide incentive for domestic manufacturing of clean energy components.	Economic Instrument	Implemented	Transport; Energy: Supply; Industrial Processes and Product Use	CO2, CH4	2023	U.S. Department of the Treasury	NA	NE
Rural Energy Savings Program (RESP)	Provides loan funds to eligible energy providers to relend to its customers for energy efficiency measures and customer owned renewable systems.	To stimulate adoption of durable, cost-effective energy efficiency measures.	Economic	Implemented	Energy: Supply, Energy: Residential and Commercial End Use	CO2, N2O	2016	U.S. Department of Agriculture	NE	NE
High Energy Cost Grants (HECG)	Provides grants to eligible organizations to provide energy assistance in rural, low-income, high-energy-cost communities.	To lower energy costs for eligible families and individuals.	Economic	Implemented and Ongoing	Energy: Supply, Energy: Residential and Commercial End Use	CO2, N2O	2000	U.S. Department of Agriculture	NE	NE
BIL Clean Hydrogen Manufacturing Recycling Research, Development,	Funded by the Bipartisan Infrastructure Law to provide Federal financial assistance to advance new clean hydrogen production, processing, delivery, storage, and use equipment	Reduce cost of manufacturing for clean hydrogen and fuel cell technologies and strengthen domestic supply chain.	Other	Implemented	Transport; Energy: Supply; Energy: Industrial End Use	CO2, CH4	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
and Demonstration Program (Sec 40314)	manufacturing technologies and techniques.									
Carbon Storage Program	Comprises CarbonSAFE, CarbonBASE, and CarbonSTORE. Partner with National Laboratories, Universities and Industry to ensure verifiable information to economically and safely assess and monitor long-term storage of CO_2 at commercial volumes and timeframes and ensure the viability of geologic carbon storage as an effective CO_2 emission reduction solution that can be widely implemented.	Address the performance challenges of operating and monitoring commercial scale CO_2 storage sites.	Other	Implemented	Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	2002	U.S. Department of Energy	430	NE
Carbon Dioxide Removal Program	Partners with industry, national laboratories, academia, and environmental justice communities to advance a diverse set of CDR approaches to facilitate gigatonne-scale carbon dioxide removal by mid-century. The program emphasizes rigorous analysis of life cycle impacts and has a deep commitment to justice. The program invests in CDR technologies, such as direct air	Remove carbon dioxide from the atmosphere.	Economic Instrument	Implemented	Other	CO2	2020	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	capture and direct ocean capture with durable storage; biomass with carbon removal and storage; and mineralization concepts to remove legacy emissions and address emissions from hard-to-abate sectors.									
Hydrogen with Carbon Management (HCM)	Partners with National Laboratories, universities and industry on RDD&D to advance carbon-based clean hydrogen production coupled to carbon capture and storage. The program comprises six activities: (1) Gasification Systems, (2) Advanced Turbines, (3) Reversible Solid Oxide Fuel Cells, (4) Advanced Energy Materials, (5) Sensors, Controls, and Other Novel Concepts, and (6) Simulation-Based Engineering.	Provide a research platform for developing the advanced systems of the future capable of net-zero emissions operations.	Economic Instrument	Implemented	Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	2021	U.S. Department of Energy	NE	NE
BIL Rare Earth Elements Demonstration Facility (Sec 40205)	A Bipartisan Infrastructure Law program to provide environmental benefits through the use of feedstock derived from acid mine drainage, mine waste, or other deleterious material; separate mixed rare earth oxides into pure oxides of each rare	Demonstrate the feasibility of a full-scale integrated rare earth element extraction and separation facility and refinery.	Economic Instrument	Implemented	Energy: Supply; Energy: Industrial Processes and Product Use	n/a	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	earth element; and provide for separation of rare earth oxides and refining into rare earth metals at a single site.									
BIL Front-End Engineering and Design Program Activities Under Carbon Capture Tech Program 962 Of EPA (Sec 40303)	A Bipartisan Infrastructure Law program that expands the Department of Energy's Carbon Capture Technology program to include a program for carbon dioxide transport infrastructure necessary to deploy Carbon Capture Utilization and Storage technologies.	Improve understanding of national infrastructure and transport needs, onshore/offshore deployment, leveraging existing oil and gas infrastructure and natural CO_2 deposits to convert these systems for CO_2 transport or dedicated CO_2 storage.	Economic Instrument	Implemented	Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	2021	U.S. Department of Energy	NE	NE
BIL Carbon Storage Validation and Testing (Sec 40305)	A Bipartisan Infrastructure Law program to establish a program of research, development, and demonstration for carbon storage.	Perform feasibility studies of potential on- and offshore storage sites that could support the deployment of CCUS for the power sector, hydrogen production facilities, hard-to-decarbonize industries (e.g., steel, cement), and storage-based CDR (e.g., DAC with CO_2 storage and BiCRS).	Economic Instrument	Implemented	Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
IRA Section 1703/1705 Loan Guarantee Program	Using these lending authorities, the DOE Loan Programs Office mitigates the financing risks associated with innovative and, in the case of the Section 1705 Program, some commercial energy projects. IRA provides $40 billion of loan authority supported by $3.6 billion in credit subsidy for projects eligible for loan guarantees under section 1703 of the Energy Policy Act of 2005. This loan authority is open to all currently eligible Title 17 Innovative Clean Energy technology categories, including fossil energy and nuclear energy, and new categories of activities, including critical minerals processing, manufacturing, and recycling.	Mitigate risks related to innovative advanced technology investments.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Industrial End Use; Industrial Processes and Product Use	CO2	2009	U.S. Department of Energy	3,831	289,157
BIL Energy Efficient Transformer Rebates (Sec 40555)	BIL program to provide rebates to industrial or manufacturing facility owners, commercial building owners, multifamily building owners, utilities, or energy service companies for the replacement of a qualified energy inefficient	Improve efficiency, reduce emissions in industrial and power generation.	Economic Instrument	Implemented	Energy: Residential and Commercial End Use; Energy: Industrial End Use	CO2, CH4	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	transformer with a qualified energy efficient transformer.									
BIL Extended Product System Rebates (Sec 40555)	BIL program to provide rebates for qualified extended product systems (i.e., electric motor, electronic control, and driven load).	Improve efficiency, reduce emissions in industrial and power generation.	Economic Instrument	Implemented	Energy: Supply; Energy: Residential and Commercial End Use; Energy: Industrial End Use	CO2, CH4	2021	U.S. Department of Energy	NE	NE
IRA Enhanced Use of Defense Production Act of 1950 (Sec 30001)	Section 30001 of the Inflation Reduction Act appropriates $500 million to carry out the Defense Production Act (DPA). President Biden issued presidential determinations providing DOE with the authority to use $250 million of the DPA funding to accelerate domestic production of key energy technologies.	Increase U.S. manufacturing capacity of electric heat pumps.	Economic Instrument	Implemented	Energy: Supply; Energy: Residential and Commercial End Use	CO2, CH4, HFCs	2022	U.S. Department of Energy	NE	NE
BIL Advanced Energy Manufacturing and Recycling Grants (Sec 40209)	A Bipartisan Infrastructure Law program to provide grants to small- and medium-sized manufacturers to enable them to build new or retrofit existing manufacturing and industrial facilities to produce or recycle	Increase U.S. manufacturing capacity for clean energy supply chains, improve efficiency, and reduce emissions in small and medium sized manufacturers.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Industrial End Use; Industrial	CO2, CH4, N2O, HFCs	2021	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	advanced energy products in communities where coal mines or coal power plants have closed.				Processes and Product Use					
BIL State Energy Program (SEP; Sec 40109)	Provides funding to state energy offices to reduce market barriers to the cost-effective adoption of renewable energy and energy efficiency technologies. Additional funding was appropriated through the Bipartisan Infrastructure Law.	Fund energy efficiency and renewable energy state programs.	Economic Instrument	Implemented	Energy: Supply; Energy: Residential and Commercial End Use	CO2	1977	U.S. Department of Energy	NE	NE
Energy Futures Grants	Incubate novel approaches to clean energy technology deployment, prioritizing investments that meet energy needs at the local level, and are inclusive in elevating impoverished and disenfranchised communities, and/or communities that have been marginalized or overburdened.	Deploy clean energy technology at the local level.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End Use	CO2	2021	U.S. Department of Energy	NE	NE
BIL Energy Efficiency and Conservation Block Grant (EECBG) Program (Sec 40552)	The Bipartisan Infrastructure Law provides new funding for the EECBG Program, which provides Federal grants to states, local governments, and Indian Tribes to assist eligible entities in implementing strategies to reduce fossil fuel emissions, to reduce	Reduce fossil fuel emissions, reduce total energy use, and improve energy efficiency in local governments, states, and Indian Tribes.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End Use;	CO2	2022	U.S. Department of Energy	NE	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	total energy use, and to improve energy efficiency.				Waste Management					
Local Government Energy Program (LGEP)	Provide competitive awards, on-site capacity, peer exchanges, and technical assistance to support the development and deployment of transformative clean energy programs that create good paying jobs working with qualifying local governments and tribal nations, with a focus on energy communities and disadvantaged or small-to-medium jurisdictions.	Support clean energy programs for local governments that create good paying jobs.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End Use	CO2	2022	U.S. Department of Energy	NE	NE
IRA National Laboratory Infrastructure - Office of Science	An Inflation Reduction Act program to support science laboratory infrastructure improvements and projects across seven Office of Science programs.	Support scientific infrastructure.	Other	Implemented	Other	CO2	2023	U.S. Department of Energy	NA	NE
Greenhouse Gas Reduction Fund - - Clean Communities Investment Accelerator	$6 billion grant program to establish hubs that provide funding and technical assistance to community lenders working in low-income and disadvantaged communities, providing an immediate pathway to deploy projects in those communities. The hubs provide capitalization funding, technical assistance awards and services for	Reduce GHG emissions in low-income and disadvantaged communities through capitalization funding and technical assistance to community lenders.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End-Use	CO2	2023	U.S. Environmental Protection Agency	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	community lenders to provide financial assistance to deploy distributed energy, net-zero buildings, and zero-emissions transportation projects in low-income and disadvantaged communities.									
Climate Pollution Reduction Grants	$5 billion grant program for states, local governments, Tribes, and territories to develop and implement ambitious climate action plans for reducing GHG emissions and other harmful air pollution.	Develop and implement climate action plans at the state, local, tribal, and territorial level.	Economic Instrument	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End Use; Energy: Industrial End Use; Industrial Processes and Product Use; LULUCF; Agriculture; Waste Management	CO2, CH4, N2O, SF6, HFCs, PFCs	2023	U.S. Environmental Protection Agency	NA	NE
Mandatory Greenhouse Gas Reporting Program	Requires reporting of GHG emissions from 41 U.S. industry groups that, in general, emit 25,000 metric tons or more of	Collect annual, accurate and timely GHG emissions data at the facility level.	Regulatory	Implemented	Energy: Supply; Industrial Processes	All	2009	U.S. Environmental Protection Agency	NA	NE

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (kt CO_2 eq)	
									Achieved (2022)	Expected (2030)
	CO_2e per year. The reporting program covers 85-90% of total U.S. emissions from over 8,000 facilities.				and Product Use; Waste Management					
Center for Corporate Climate Leadership	Serves as a resource center for organizations interested in GHG measurement and management, to reduce the business risks and environmental impacts associated with climate change.	Support organization-wide GHG measurement and management.	Other	Implemented	Transport; Energy: Supply; Energy: Residential and Commercial End Use; Energy: Waste Management	All	2012	U.S. Environmental Protection Agency	NA	NE
Sustainable Materials Management and Circular Economy	Provides a systemic approach to reduce the use of materials and their associated environmental impacts over their entire lifecycle.	Encourage sustainable materials management.	Other	Implemented	Energy: Supply; Industrial Processes and Product Use; Waste Management	All	2009	U.S. Environmental Protection Agency	NE	NE

Actions, policies, and measures that were reported in the U.S. Eighth National Communication and Fifth Biennial Report (December 2022) and that are no longer in place:

- U.S. Department of Agriculture – Guaranteed Underwriting Program (313A)

Actions, policies, and measures that were reported in the U.S. Eighth National Communication and Fifth Biennial Report (December 2022) but are now reported under different names:

- U.S. Department of Transportation (DOT) and U.S. Environmental Protection Agency (EPA) – the prior report included an entry for the "National Program for Light Duty Vehicle GHG Emissions and Fuel Efficiency Standards" that combined EPA's greenhouse gas emissions standards and DOT's fuel efficiency standards. To provide greater clarity about recent final rules, this report provides separate entries for EPA's "Light-duty and Medium-duty Vehicle GHG Standards" and "Heavy-Duty Vehicle GHG Standards" and for DOT's "Corporate Average Fuel Economy Standards."
- U.S. Department of Transportation – the prior report included a separate entry for the U.S. Aviation Climate Action Plan, and those efforts have continued, but are captured by the entries on the Transportation Decarbonization MOU and Blueprint and on the Sustainable Aviation Fuel "Grand Challenge" and Roadmap. The prior report also included an entry on Federal Transit, Highway, and Rail Programs, and this table instead includes more specific entries on particular relevant programs, such as the Transit Bus Electrification Tool, the National Electric Vehicle Charging Infrastructure Program, the Charging and Fueling Infrastructure Discretionary Grant Program, the Carbon Reduction Program, the Reduction of Truck Emissions at Port Facilities Grant Program, the Low Carbon Transportation Materials Program, and the Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program.
- U.S. Department of Energy – The prior report included an entry on the Integrated TESTBED program to demonstrate high temperature particle thermal energy storage coupled with an advanced supercritical power cycle. That project is unlikely to proceed at this time. The item has been replaced by the Gen3 Particle Pilot Plant (G3P3), which will accomplish many of the same objectives.

Annex 2: Methodology for Greenhouse Gas Emissions Reduction Estimates of Actions, Policies, and Measures

This Annex provides explanations of the methodologies and assumptions used to develop the estimated greenhouse gas (GHG) emissions reduction impacts that are presented for several key actions, policies, and measures in Annex 1. Quantified estimates are currently available for a subset of actions, policies, and measures implemented by several federal agencies. While estimation approaches vary, each methodology description conforms to a template that was provided to the agencies to organize the data in a way that helps provide clarity and transparency to international and domestic communities.

For achieved GHG emission reductions, estimates are provided for the year 2022 where feasible, a year selected given data availability considerations and given that 2022 is the most recent year presented in the latest U.S. national GHG inventory, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*. For expected GHG emission reductions, estimates are provided for the year 2030 where feasible, a year selected given the U.S. has an NDC economy-wide target of reducing net GHG emissions by 50-52 percent below 2005 levels in 2030.

This Annex is organized by federal agency, with methodology explanations for each available estimate, followed by each agency's explanation of why estimates are not currently available for other actions, policies, and measures.

Contents

U.S. Environmental Protection Agency

U.S. Department of Transportation and U.S. Department of the Treasury

Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Regional Conservation Partnership Program (RCPP), Conservation Technical Assistance Program (CTA)

Sector(s) Affected: Agriculture

Implementing Entity: U.S. Department of Agriculture - Natural Resources Conservation Service

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?

EQIP: 17,834 kt CO_2 eq (Calendar Year)
CSP: 2,213 kt CO_2 eq (Calendar Year)
RCPP: 326 kt CO_2 eq (Calendar Year)
CTA: 8,013 kt CO_2 eq (Fiscal Year)

If available, what is the estimate of GHG emission reductions expected in the year 2030?

EQIP/RCPP-EQIP: 23,500 kt CO_2 eq (Calendar Year)
CSP: 2,500 kt CO_2 eq (Calendar Year)

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?

The 2022 estimates are derived from actual program data. In the absence of information on Farm Bill provisions or other funding opportunities for 2030, the 2030 estimate is assumed to be equal to the 2022 estimate plus additional known impacts of the dedicated GHG emissions funding through the Inflation Reduction Act (IRA).

The 2030 estimates are derived from a series of conservation practice-specific marginal abatement cost curves developed by U.S. Department of Agriculture's (USDA) Office of the Chief Economist. These curves provide an estimate of GHG reductions by practice for each of the programs' IRA funding levels between 2023 and 2026. Practices contracted during that period with structural lifetimes that are greater than a year (e.g., manure management practices) are expected to have GHG emissions reductions that persist beyond the 2023-2026 period, and the 2030 emissions reductions estimates reflect anticipated benefits from the 2030 Farm Bill spending (assumed to be the same as 2022 impacts) plus the persistent benefits calculated from the Inflation Reduction Act spending. Given the voluntary nature of Natural Resources Conservation Service (NRCS) conservation programs, there will likely be variation from these estimated impacts.

The 2030 estimates are combined for EQIP and RCPP, because the analysis does not differentiate between practices implemented through regular EQIP from those implemented through RCPP-EQIP. Estimates for 2030 are not available for CTA.

__Timeframe__

In what year did the program start?

EQIP: 1996
CSP: 2014
RCPP: 2014
CTA: 1935

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?

Emission reductions are estimated using emissions reduction coefficients generated by calculating the differences between an implemented conservation practice and baseline scenarios, which are assumed at the time of practice implementation. The published NRCS conservation practice lifespan is utilized for calculating benefits beyond the date of initial conservation practice implementation.

__Emissions Estimation Approach__

Which gases are measured?

Methane (CH_4), Nitrous Oxide (N_2O), Carbon dioxide (CO_2)

For non-CO_2 gases, what global warming potential (GWP) values were used?

The 100-year GWP values from the IPCC Fifth Assessment Report (AR5) were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

The estimated impacts were calculated using county-level contract data multiplied by county-level GHG emission reduction coefficients derived from COMET-Planner. For EQIP, CSP, and RCPP, the primary data source used is contract activity data from the NRCS's Program Contracts System (ProTracts). For CTA, the primary data source is program activity data from the NRCS's National Planning and Agreements Database (NPAD).

COMET-Planner is a web-based tool that uses a sample-based, metamodeling approach to estimate the average impact of a conservation practice compared to baseline conditions. The metamodeling approach models results from the entity-scale tool COMET-Farm and is conducted over a range of soils, climate, and typical crops within multicounty regions as defined by Major Land Resource Areas (MLRA), rectified to the county level.

In order to align COMET-Planner data with NRCS conservation practice activity data, the COMET-Planner prescription data is averaged by conservation practice for each county. Annual impacts are accounted for over the duration of a practice's lifespan up to the current year. The 2022 data includes practices implemented in 2022, as well as benefits accrued in 2022 from practices previously implemented for which benefits would still be expected based on the conservation practice lifespan.

What approaches are used to ensure data quality, if any?

Measures taken to ensure data quality include a systematic process for addressing duplicate records and a Z-Score analysis to identify and remove contract data considered to be outside of the reasonable range. Duplicate records are removed and data points within a national Z-Score range of 30 and greater are removed. The Z-Scores are calculated by practice, and outlying data points are compared with the distribution of the national data set for a given practice.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

The quantified estimates reflect most of the emission reductions anticipated from this measure. These estimates currently do not include several conservation practices that are not modeled within COMET-Planner, but that are expected to provide additional GHG emission reductions. The estimates also do not include potential additional benefits that may be expected due to the persistence of management practices beyond the practice lifespan. For RCPP, program estimates only represent conservation practices implemented through RCPP-EQIP and RCPP-CSP. There may be additional benefits associated with RCPP projects that are not reflected in these estimates.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

The methodology currently only accounts for GHG impacts associated with the policy's direct effects and implementation of on-farm conservation practices.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?

Several updates were made to the methodology from estimates in the previous report, including the inclusion of GHG impacts over the entire duration of a practice's lifespan, and the exclusion of Conservation Legacy Effect GHG impacts that would take place beyond the practice lifespan. An additional measure for systematically addressing data quality was also implemented this year utilizing the Z-Score analysis, as described above. These updates are expected to provide more conservative estimates and therefore may result in general in a decrease in estimated values when compared to the previous report. COMET-Planner GHG emission reduction co-efficients were also updated in 2023 to reflect recent updates within the COMET-Planner (Version 3), including modeling for soil organic carbon and soil nitrous oxide that uses a newer version of the DayCent model, that models soil depth to 30 cm, whereas the prior model simulated a depth of 20 cm. Unlike previous years, program benefits were also estimated for RCPP practices that were implemented under EQIP and CSP this year, using the same methodology that has been used for EQIP and CSP.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

Because the estimates are based on NRCS program data, it is not expected that other federal agencies would claim attribution for the GHG impacts included in these estimates. To avoid double counting, NRCS does not include GHG impacts associated with technical assistance the agency provided for Farm Service Agency's Conservation Reserve Program.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

While EQIP, CSP, and RCPP estimates are provided for calendar year 2022, CTA estimates are provided for fiscal year 2022. However, both data sets represent a single year of data.

Methods for estimating GHG impacts for Agricultural Conservation Easement Program are currently under development and unavailable at this time. Estimates for GHG impacts from Conservation Innovation Grants and USDA Climate Hubs are unavailable at this time.

Conservation Reserve Program

Sector(s) Affected: Agriculture

Implementing Entity: U.S. Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
29,940 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
18,862 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1985

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
The total GHG benefit figure is derived from a combination of CO_2, CH_4, and Nitrous Oxide (N_2O).

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane, 265 nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Estimates are calculated by combining program data on regional acreage with regional impact estimates from a USDA practice impact tool--COMET Planner.[1] COMET Planner's primary sources for data and information are USDA's entity-scale inventory along with DayCent for soil

depth modelling, USDA Economic Research Service for average nitrogen fertilizer rates for major crops, and USDA National Agricultural Statistics Service for data on planting and harvest dates. For Wetland practices, a Tier 1 method following 2006 IPCC guidelines is utilized to generate a flat benefit figure.

What approaches are used to ensure data quality, if any?
Methodology and results have been reviewed at length during internal USDA discussions.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The quantified GHG estimates account for the vast majority of anticipated effects from enrolled land in CRP. In addition to the stated GHG benefits, there are also environmental and ecological benefits to Conservation Reserve Program practices such as protecting against soil erosion and preventing runoff of phosphorous, nitrates, and sediment from reaching bodies of water.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
The methodology does not account for impact outside the primary sector or beyond the direct effects.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
The same methodology was used, but in calculating the total benefits, the nitrous oxide impacts component was updated to use the IPCC AR5 100-year GWP values.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
N/A

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Partnerships for Climate-Smart Commodities

Sector(s) Affected: Agriculture

Implementing Entity: U.S. Department of Agriculture

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
5,834 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

<u>**Timeframe**</u>

In what year did the initiative start?
2023

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CO_2, N_2O, CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane, 265 nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Rough estimates are calculated by extracting projected conservation activity data from project descriptions and combining them with national average impact estimates from the literature, COMET-Planner,[2] and expert opinion. Practices are assigned lifespans based on technical specifications and contract lengths, and estimates for 2030 reflect persistent benefits expected

from practices implemented during the projects' 2023-2027 funding window. Estimates are subject to high uncertainty associated with projected activities and their assumed impacts.

What approaches are used to ensure data quality, if any?
N/A

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unlikely. The practices funded through the Partnerships for Climate-Smart Commodities are not eligible for NRCS conservation funding as well (a producer cannot receive funds from both sources for the same practice on the same field) so there should not be double counting between those projections.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Higher Blends Infrastructure Incentive Program

Sector(s) Affected: Transport

Implementing Entity: U.S. Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
1,218 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2020

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The Program is still in the process of implementing its strategy for data collection and reporting. For current value, the HBIIP mitigation impact reported is based on average annual production of higher blend gallons incentivized by the program. From 2020 to 2024, approximately 2 billion total gallons of higher blend fuels have been produced (972 million gallons of ethanol, 804 gallons of biodiesel, and 290 million gallons of ethanol and biodiesel mix) which results in

400 million total gallons of higher blend fuels. Estimated reduction in GHG emissions assumes gasoline 116,090 Btu/gallon versus ethanol 76,330 Btu/gallon. Biofuel and fossil fuel changes accounted in a gasoline basis and calculated through EPA's Greenhouse Gas Equivalencies calculator.[3]

What approaches are used to ensure data quality, if any?
Environmental assessment required for obligations and loan specialists verify authenticity of estimated energy savings/production. After data entry, outlier checks are done.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Unknown.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Additional funding through IRA 22003 Biofuel Infrastructure and Agriculture Product Market Expansion (Higher Blend Infrastructure Incentive Program) has increased the size and impacts of the program, but the methodology remains the same.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unknown

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Advanced Biofuel Payment Program

Sector(s) Affected: Energy: Supply

Implementing Entity: Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
1,510 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2009

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The Program is still in the process of implementing its strategy for data collection and reporting. For the current value, the mitigation impact uses the estimated program impact in billions of gallons of advanced biofuels for biofuels between 2009-2022, averaged out to express an annual estimate of a representative year between 2009-2022—approximately 500 million gallons of advanced biofuels. Estimated reduction in GHG emissions assumes gasoline 116,090

Btu/gallon versus ethanol 76,330 Btu/gallon. Biofuel and fossil fuel changes accounted in a gasoline basis and calculated through EPA's Greenhouse Gas Equivalencies calculator.[4]

What approaches are used to ensure data quality, if any?
Environmental assessment required for obligations and loan specialists verify authenticity of estimated energy savings/production.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Unknown.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unknown

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program

Sector(s) Affected: Energy: Supply; Energy: Industrial End-Use

Implementing Entity: U.S. Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
68.04 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
406.23 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Estimates are made based upon information received in engineering and feasibility reports. Moving forward, the metric will be measured based upon actual production and forecast based on historical data.

Timeframe

In what year did the program start?
2009

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane, 265 nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

Program still in process of implementing strategy for data collection and reporting. For current value, mitigation impact is a projected annual estimate of one Anaerobic Digester Project.

What approaches are used to ensure data quality, if any?
Environmental assessment required for obligations and loan specialists verify authenticity of estimated energy savings/production.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Unknown.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unknown

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Electric Loan Program

Sector(s) Affected: Energy: Supply

Implementing Entity: U.S. Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
1600 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1936

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2, N_2O

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane, 265 nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Estimated indirectly through National Rural Electric Cooperative Association (NRECA) reports that estimates US electric cooperative emission reductions for 2016-2022 averaged over 6 years for an annual estimate. Sum of 3.67M short tons/year reduction of CO_2 and 6.67K short tons/year reduction of N2O with a 265 CO_2 eq multiplier and converted to metric tons. For

Rural Utilities Services (RUS) creditable share of the total: RUS Borrowers are 65% of the sector and RUS provides 50% of the long-term debt. This results in: 1,600 kt CO_2 eq (1,080 kt CO_2 eq from CO_2 annual reduction + 520 kt CO_2 eq from N_2O annual reduction).

NRECA (which uses EPA and EIA data) reports:
2022 Report[5]
2019 Report[6]
2016 Report[7]

What approaches are used to ensure data quality, if any?
N/A

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All, although precision from estimation procedure is lacking.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Additional years of estimated reduction in CO_2 and N_2O from NRECA annual reports added for estimate. Previous estimate used 310 GWP multiplier for N_2O (based on Second Assessment Report) and has been revised to the guidance of a 265 multiplier based on the Fifth Assessment Report.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unknown

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Powering Affordable Clean Energy (PACE) Program

Sector(s) Affected: Energy: Supply

Implementing Entity: U.S. Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
2100 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2022

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Energy values come from self-reports of applicants that are verified by USDA loan specialists that service the obligation. All PACE projects are converted to a consistent electric energy (kilowatt hours) that represents the expected annual energy generation or savings from use of battery energy storage system. The project's annual energy generated/saved amount is then multiplied by a state level emission factor to estimate the reduction of CO_2 equivalent in metric

tons. The emission factors come from EPA's Emissions & Generation Resource Integrated Database (eGRID) which provide annual state level estimates of emissions. The literal variable from eGRID that serves as the emission factor is STC2ERTA (State annual CO_2 equivalent total output emission rate (lb/MWh)). Unit conversion is then applied to create the GHG avoided/reduced which is measured in metric tons of carbon dioxide equivalent.

What approaches are used to ensure data quality, if any?
Loan specialist review for project feasibility and eligibility for the program.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unknown

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Rural Energy for America Program

Sector(s) Affected: Energy: Supply

Implementing Entity: U.S. Department of Agriculture

__Achieved and/or Expected Reductions__

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
4085 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
7740 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Expected GHG reductions in 2030 assumes the average annual increase in GHG reductions from 2014 to 2022 will continue until the average project lifespan (approximately 20 years).

__Timeframe__

In what year did the program start?
2008

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

__Emissions Estimation Approach__

Which gases are measured?
CO_2, CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane, 265 nitrous oxide

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Energy values come from self-reports of applicants that are verified by USDA loan specialists that service the obligation. All REAP projects (biomass, wind, solar, energy efficiency, etc.) are converted to a consistent electric energy (kilowatt hours) that represents the expected annual

energy generation/savings for implementing the project. The project's annual energy generated/saved amount is then multiplied by a state level emission factor to estimate the reduction of CO_2 equivalent in metric tons. The emission factors come from EPA's eGRID which provide annual state level estimates of emissions. The literal variable from eGRID that serves as the emission factor is STC2ERTA (lb/MWh). Unit conversion is then applied to create the GHG avoided/reduced which is measured in metric tons of carbon dioxide equivalent.

What approaches are used to ensure data quality, if any?
Loan specialist review for project feasibility and eligibility for the program.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Additional funding through IRA 22002 Rural Energy for America Program. Previous estimates only included projects receiving direct funding from the program for year in question even though these projects have multi-year lifespans that provide GHG reductions beyond the first year of operation. This has been updated to reflect the still active projects in a year's estimated GHG reduction regardless of if the funding occurred in the year in question.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Potential issues for certain types of energies to be double counting GHG reduction based on inputs used for a project but there should not be double counting issues related to outputs.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Empowering Rural America New ERA Program

Sector(s) Affected: Energy: Supply

Implementing Entity: U.S. Department of Agriculture

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
51630 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2022

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2, N_2O, CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Internally developed Achievable Reduction Tool (ART) that accounts for the change in outputted GHG emissions from the purchase of renewable energy, renewable energy systems, zero-emission systems, carbon capture and storage systems, to deploy such systems, or energy efficiency improvements to generation & transmission system. Tool identifies a baseline of

total energy generated, total energy purchased, and total system grid loss for an applicant and compares this with the proposed project to identify GHG reductions. GHG Emission Factors are referenced from eGRID, U.S. Environmental Protection Agency, and the Energy Information Administration. National Average Factors are used for simplicity and consistency.

What approaches are used to ensure data quality, if any?
Loan specialist review for project feasibility and eligibility for the program.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Unknown

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
ART uses national US estimates for reduction factors, which reduces precision of estimates.

U.S. Department of Agriculture – Explanations of Unavailable GHG Emissions Reduction Estimates

For the following actions, policies, and measures, the programs are in the process of implementing a strategy for collecting energy information from funded projects, but estimates are not yet available:

- Rural Energy Savings Program (RESP)
- High Energy Cost Grants (HECG)

For the following actions, policies, and measures, the programs are not structured to collect the necessary data to produce this analysis, nor is ancillary monitoring available to produce an accurate and credible estimate. Designing appropriate data collection and analysis workstreams for the following actions, policies, and measures will require significant planning and investment:

- Forest Legacy Program (FLP)
- Collaborative Forest Landscape Restoration Program (CFLRP)
- Forest Health
- Community Forest Program (CFP)
- Forest Stewardship Program (FSP)
- Great American Outdoors Act (GAOA) (Legacy Restoration Fund and Land and Water Conservation Fund)
- Joint Chiefs' Landscape Restoration Partnership
- Landscape Scale Restoration (LSR)
- Sustainable Forestry and African American Land Retention Program (SFLR)
- Urban and Community Forestry (UCF) Program
- Wood Innovations Program
- Forest ecosystem restoration and hazardous fuels reduction programs
- Healthy Forest Reserve Program

Estimates are unavailable for the following actions, policies, and measures for the reasons provided:

- Agricultural Conservation Easement Program (ACEP): Methods for estimating emissions reductions from ACEP are under development and estimates are not yet available.
- Conservation Innovation Grants (CIG): As data associated with the implementation of practices through CIG are unavailable, emission reductions from CIG are not estimated.
- Conservation Technical Assistance Program (CTA): Since CTA is not associated with financial assistance contracts and expenditures, emission reductions attributed to CTA in 2030 are not estimated.
- USDA Climate Hubs: As data associated with the implementation of practices with support from the Climate Hubs are unavailable, emission reductions from the Climate Hubs are not estimated.

Vehicle Technologies Deployment (Clean Cities and Communities)

Sector: Transport

Implementing Entity: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Vehicle Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
5,378 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
11,396 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Nearly 100% of natural gas being used in vehicles in 2030 is anticipated to be Renewable Natural Gas (RNG), based on the fact that RNG accounts for approximately 80% of natural gas used in vehicles now (per our recent analysis that is largely in agreement with Transport Project's analysis)[8], production is increasing by 13% per year,[9] and vehicle natural gas will likely reach saturation before other uses that aren't rewarded by the Renewable Fuel Standard (RFS) and Low Carbon Fuel Standard (LCFS) start to consume RNG.

We assume that the future mix of RNG mirrors the mix reported by Clean Cities and Communities in 2023 (57% landfill gas and 43% animal and wastewater gas).

Timeframe

In what year did the program start?
1993

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, N_2O

For non-CO_2 gases, what GWP values were used?

The 100-year GWP values from the IPCC (AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Fuel quantity and reported emission factors from the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model are used. Estimates of annual Vehicle Miles Traveled (VMT) and fuel economy are used if not known.

What approaches are used to ensure data quality, if any?
Data checks by coalition directors, regional managers, National Renewable Energy Laboratory (NREL) and Department of Energy (DOE) headquarters, in that sequence.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
A small portion is derived from estimates of the impact that Clean Cities and Communities outreach events have on private drivers.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
No

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Advanced Technology Vehicle Manufacturing (ATVM) Loan Program

Sector(s) Affected: Transport

Implementing Entity: U.S. Department of Energy / Loan Programs Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
21,005 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
138,223 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
The 2022 emissions reduction estimate is derived based on reporting of operating/closed projects and their associated calculated emissions based on the approach described below (see emissions estimation approach).

In contrast, the 2030 emissions reduction estimate is based on the current pipeline projects expected to be financed under the ATVM statute. The data sources for the 2030 estimates include projections based on assumptions submitted by the applicants and technical calculations using simulation tools.

Timeframe

In what year did the program start?
The ATVM Program was authorized under section 136 of the Energy Independence and Security Act of 2007. The ATVM Program was implemented under an interim rule issued on November 12, 2008. Furthermore, the Program was expanded in 2021 under the Bipartisan Infrastructure Law.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
The ATVM Program, per the legislation, compares GHG emissions attributed to reductions in gasoline usage against a 2005 fuel economy baseline for light duty vehicles, and 2016 fuel economy baseline for medium and heavy-duty vehicles.

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The impacts are measured using emission factors based on gasoline displaced by the improvement in fuel economy of vehicles produced as compared to the 2005 fuel economy baseline for the vehicle type.

Annual avoided CO_2 is calculated from the projects' actual (2011-2022) or projected (2023-2030) annual petroleum displaced in gallons, multiplied by the EIA Fuel Emission factor of 19.37 lbs. CO_2/gallon for gasoline.[10] Using the conversion factor where a metric ton (tonne) is equal to 2,204 lbs, the calculation is:

$$Annual\ CO_2\ Emissions\ Avoided = Project's\ Annual\ Petroleum\ Savings * \left[\frac{(19.54 lbs\ CO_2/gallon\ of\ gasoline)}{(2{,}204 lbs\ CO_2/tonne)}\right]$$

Annual reductions in gasoline usage is based on the annual average vehicle miles driven (approx., 12,000 miles). The calculation is based on the difference of a 2005 vehicle fuel economy baseline (legislation required this baseline) and the model year fuel economy of the vehicles that have been or will be produced from the ATVM program in miles per gallon. The calculation uses the actual or planned annual production of those vehicles. The calculation for conventional vehicles is:

$$Annual\ Petroleum\ Displaced = Production\ Volume * \left[\left(\frac{12{,}000}{Baseline\ Fuel\ Economy(mpg)}\right) - \left(\frac{12{,}000}{ATV\ Fuel\ Economy(mpg)}\right)\right]$$

The calculation for EV's and Alternative Fuel vehicles is:

$$Annual\ Petroleum\ Displaced = Production\ Volume * \left(\frac{12{,}000}{Baseline\ Fuel\ Economy}\right)$$

Finally, Loan Programs Office (LPO) assumes the savings are realized for as long as the vehicle operates, which is estimated to be 10 years, at least.[11] In other words, savings will continue for 10 years after the last vehicle or component in the portfolio has been manufactured.

What approaches are used to ensure data quality, if any?
Data quality for the projected results are ensured through the following approaches:

- Site visits and periodic conference calls between the borrower and LPO to verify and validate facilities are operating in accordance with the Projects' reporting.
- Project reporting in line with program and loan requirements
- Modeling and simulation
- Industry reports, market analysis and other federal estimates.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The reductions represent most of the effects anticipated from the policy, and include incremental mitigation projections from added credit subsidy authority (~$3B) to existing program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
The methodology adopted in the Fifth Biennial Report to calculate 2030 estimates was based on a reference sample of active projects at the time, extrapolated to reflect what the perceived benefit would be at full operations. The active project sample set at the time was predominantly dominated by vehicle manufacturers, whereas the current portfolio/pipeline has a balance of vehicle manufacturerss, component manufactures and critical material suppliers. This provides a more realistic estimate of benefits and revises the previous estimate of 367,873 kt of CO_2 eq to 139,429 kt of CO_2 eq.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
LPO loans are for project-specific costs. DOE is not aware of any other federal policy attributing GHG impacts from our projects.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
In 2021, the ATVM scope was expanded from light-duty vehicles to include medium- and heavy-

duty vehicles, aircrafts, maritime vessels, trains, and hyperloops. LPO is developing program guidelines to implement these new transportation methods. Therefore, the existing calculation methodology is primarily based on light-duty vehicle projections and may change in the future.

Advanced Reactor Demonstration Program

Sector(s) Affected: Energy: Supply

Implementing Entity: U.S. Department of Energy – OCED

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
440 kt CO_2 eq / yr

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2022

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2020

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, N_2O

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
An advanced small modular reactor will be built at the DOW Seadrift Operations manufacturing facility to provide the site with zero-emissions power and steam for manufacturing processes, which will replace current fossil-fuel inputs. This will reduce the emissions of the facility by 440 kt CO_2 eq/yr.

Today, Seadrift directly measures its flow of fuel. The current emissions from the facility were calculated by quantifying the volume of facility fuel usage and other emissions sources and then multiplying those volumes by the relevant emissions factors.

Next, the overall GHG impact of the project was estimated by calculating the expected power and steam generated from the reactor, and how much of the current power and heat/steam generation at the facility it will replace. Using the volume of current power and heat/steam replaced by the project multiplied by the relevant emissions factors, the total emissions impact of the project was estimated.

What approaches are used to ensure data quality, if any?
Seadrift currently does internal monthly emissions reporting for the facility, as well as quarterly and annual data validation. They will continue this practice once the reactor is installed. In addition, Deloitte, a private auditing firm, provides limited assurance of the emissions estimates for the facility today.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
This reflects the emissions reduction of one of the two advanced nuclear projects selected for funding.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No – it only addresses the direct impact of switching the energy source of the facility to the nuclear reactor.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The method applied does not adjust for double counting – DOE does not believe there are other Partner Account Managers (PAMs) that would attribute emission reductions related to the project.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Appliance and Equipment Standards Program

Sector(s) Affected: Energy: Residential & Commercial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
316,800 kt CO_2 eq.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
212,000 kt CO_2 eq.

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
The Energy Policy and Conservation Act (EPCA) was enacted in 1975, and established a federal program consisting of test procedures, labeling, and energy targets for consumer products. EPCA was amended in 1979 and directed the DOE to establish energy conservation standards for consumer products. The first energy conservation standards were enacted in 1987 with the National Appliance Energy Conservation Act.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Emissions reductions are calculated from the starting year of each individual energy conservation standard.

Emissions Estimation Approach

Which gases are measured?
CO_2 and CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Emissions reductions are estimated from modeling (Annual Energy Outlook using the National Energy Modeling System – NEMS). Energy savings (in quads) resulting from an energy conservation standard are combined with emission factors appropriate to the sector and end use of the appliance or equipment to estimate emissions reductions.

What approaches are used to ensure data quality, if any?
No specific additional steps are implemented. Annual Energy Outlook (AEO) and NEMS are ubiquitous tools used in the energy systems modeling community.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
These estimates reflect the effects of all implemented policy actions under these programs.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No. The methodology accounts for all domestic energy/emissions savings from the usage of a given appliance or equipment, but there may be spill-over effects in other international markets or jurisdictions. These effects are not analyzed.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
There are no key changes to the methodology for these programs. However, estimates provided in the Fifth Biennial Report were for CO_2 alone, whereas in this iteration CH_4 is also included.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
There are no other Federal programs for which emissions would be double counted with this program, so the GHG estimates do not need to account for this.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Building Energy Codes Program

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
32,400 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
46,800 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
DOE's Building Energy Codes Program was established in 1991 (though DOE had activities supporting building energy codes and standards prior to this time via the legacy agencies that formed DOE). DOE's directives supporting building energy codes are contained in the Energy Conservation and Production Act (ECPA), as amended, and were added in 1992.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2010. Previous benefits from state and local codes improvements through construction prior to 2010 are not included.

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, and N_2O

For non-CO_2 gases, what GWP values were used?
The analyses DOE performs for its rulemakings do not evaluate the GWP of emissions. The analyses estimate emissions reductions in physical units for each GHG gas. The benefits of emissions reductions are also monetized using a social cost of GHG appropriate to each GHG gas.

For the purposes of reporting in this form, the 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Estimated from computer modeling of building codes, U.S. climates, industry data, and emissions factors.[12]

Site Energy savings estimates developed by DOE by code version and by state for both residential and commercial building codes, using computer modeling (EnergyPlus) and standard set of building models and U.S. climates.

Building new construction estimates were developed using industry data (FW Dodge). Adoption rate assumptions at state level were based on historical data on state adoption speed. Realization factors (e.g., compliance) were used in going from EnergyPlus modeled savings estimates to predicted savings in actual constructed buildings.

Emission factors are marginal emission factors developed originally for DOE's Appliance and Equipment Standards program (AESP) based on analysis of DOE/EIA 2022 Annual Energy Outlook publication and data tables/files to derive marginal emission factors for electrical grid energy reductions year by year through 2050. Emission factors for site fossil fuel combustion from EPA.

Note. Savings estimates do not include estimates from states whose energy codes are significantly different than the model codes (90.1, International Energy Conservation Code) that DOE's efforts primarily address, nor do the estimates account for all alterations and additions to existing buildings that may also be impacted by building codes.

What approaches are used to ensure data quality, if any?
Methodology and calculations undergo significant internal review and are published in an external technical report, which is updated regularly to coincide with updated editions of the national model energy codes. Analysis estimates reflect engineering judgment for modeling of code-impacts, use of standardized suite of building model and climates, and internally developed weighting factors. Emission factor estimates are national based on EIA's AEO and NEMS tool and are identical to those used in DOE's AESP.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most. The savings estimates are a based on modeled historical improvement in building driven energy consumption and historical adoption rates. Higher adoption and compliance rates could come from more aggressive/program policy efforts and have the potential to further increase savings.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
Generally, no. The estimate is for code adoption in states which adopt codes similar to the ASHRAE 90.1 or International Energy Conservation Code (IECC) codes. The analysis looks at code adoption as a whole in these states, although both code adoption and code development are significantly due to the efforts of a variety of stakeholder and state government policies. Further the analysis focuses on energy consumption related (operational) emission and does not take into account lifecycle/embodied carbon increases or reductions in societal emission that might occur due to updated building codes.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
The program expanded from evaluating the impacts of three emissions (CO_2, CH_4, N_2O) to six types of emissions (CO_2, CH_4, N_2O, SO_2, NO_x, and Hg), but the new gases are not included in this Biennial Transparency Report since they are not GHGs. The current projections have slightly decreased as a result of updated emission factors. The Fifth Biennial Report only reported CO_2, whereas this round of reporting also includes N_2O and CH_4.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes. The estimate is developed to specifically avoid double counting the impact of higher equipment standards (AESP program related) emission benefits, as well as rulemaking activities for federal buildings and additional savings expected as the result of Bipartisan Infrastructure Law (BIL) funding supporting building energy codes.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
For the 2022 GHG reduction estimate, CO_2 accounts for 27,000 kt CO_2 eq of the total 32,400 kt CO_2 eq. For the 2030 GHG reduction estimate, CO_2 accounts for 39,000 kt CO_2 eq of the total 46,800 kt CO_2 eq.

Federal Buildings Rulemakings (Codes and Clean Energy)

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
140 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
158 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1992. The ECPA, as amended in 1992, directed DOE to establish federal building energy efficiency standards.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2010. Previous benefits from state and local codes improvements through construction prior to 2010 are not included.

Emissions Estimation Approach

Which gases are measured?
The GHG gases included in the analyses are CO_2, CH_4, and N_2O. Non-GHGs SO_2, NO_x, and Hg are included in the analyses but not in this reporting.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

Emissions reductions are estimated from computer modeling of building codes, using U.S. climate zones, industry data, and emissions factors.[13]

Note that the above report describes the methodology used here but does not quantify the impacts for federal buildings. The calculation for federal buildings was performed separately based on historical updates to federal buildings standards and the recent publication of the Clean Energy Federal Buildings Rule (March 2024).

Site Energy savings estimates were developed by DOE by code version and by state for both residential and commercial building codes, using computer modeling (EnergyPlus) and a standard set of building models and U.S. climates. Building new construction estimates were developed using industry data (FW Dodge). Adoption rate assumptions at the state level were based on historical data on state adoption speed. Realization factors (e.g., compliance) were used in going from EnergyPlus modeled savings estimates to predicted savings in actual constructed buildings. Emission factors are marginal emission factors developed originally for DOE's AESP based on analysis of DOE/EIA 2022 Annual Energy Outlook publication and data tables/files to derive marginal emission factors for electrical grid energy reductions year by year through 2050. Emission factors for site fossil fuel combustion are from EPA.

Note, energy savings estimates do not include estimates from states whose energy codes are significantly different than the model codes (90.1, International Energy Conservation Code) that DOE's efforts primarily address, nor do the estimates account for all alterations and additions to existing buildings that may also be impacted by building codes.

What approaches are used to ensure data quality, if any?

Methodology and calculations undergo significant internal review and are published in an external technical report, which is updated regularly to coincide with updated editions of the national model energy codes. Analysis estimates reflect engineering judgment for modeling of code impacts, use of standardized suite of building model and climates, and internally developed weighting factors. Emission factor estimates are national based on EIA's AEO and NEMS tool and are identical to those used in DOE's AESP.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

Most. The energy savings estimates are a based on modeled historical improvement in building-driven energy consumption and historical building energy code adoption rates. Higher adoption and compliance rates could come from more aggressive/program policy efforts and have the potential to further increase savings.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
Generally, no. The estimate is for code adoption of the updated ASHRAE 90.1 or IECC codes. Further, the analysis focuses on energy consumption-related (operational) emissions and does not take into account lifecycle/embodied carbon increases or reductions in societal emissions that might occur due to updated building codes or related federal actions.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Only slight updates were made to the calculation methodology, including updates to the development of marginal electric grid emission factors consistent with the DOE/EIA 2022 Annual Energy Outlook. Reporting of N_2O and CH_4 are in addition to the previous Biennial Report submittal. The current emission reduction estimates have slightly decreased as a result of updated emission factors.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes. The estimate is developed to specifically avoid double counting the impact of higher equipment standards (AESP program related) emission benefits, as well as rulemaking activities for federal buildings and additional savings expected as the result of BIL funding supporting building energy codes.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Home Performance with ENERGY STAR

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
52,831 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
68,455 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Achieved CO_2 eq includes project data reported by participating utility program sponsors. For our projections post-2022, we assume a conservative 10% annual increase in households served.

Timeframe

In what year did the program start?
The program started in 2002.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A.

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
The vast majority of greenhouse gas mitigation for Home Performance with ENERGY STAR occurs through CO_2 mitigation. Home Performance with ENERGY STAR does not track non-CO_2 GHG mitigation, such as hydrofluorocarbons (HFCs) from decommissioned AC systems or appliances.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Estimated impacts are based on reaching program targets in terms of the number of homes meeting the performance standard. Data sources include estimates reported by participating utility program sponsors and Federal estimates using national datasets of baseline home energy consumption, such as EIA's Residential Energy Consumption Survey (RECS). Based on the number of homes meeting the performance standard, energy savings are converted into GHG impacts using EPA's marginal CO_2 emissions factor (national average) for the electricity sector, and EIA emissions factor for natural gas.

What approaches are used to ensure data quality, if any?
Figures were carefully reviewed by DOE staff and contractor support team managing the Home Performance with Energy Star (HPwES) program. Estimates were made using federally produced datasets. Reported projects and measures are reviewed by DOE staff.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No. Residential emissions reductions from utility programs that do not participate in HPwES (or no longer participate but continue to offer other programs and services, such as heating and cooling rebates) are not included in the HPwES estimates. The program also does not track savings from households that may benefit from HPwES services (i.e., an energy assessment) and then choose to make improvements independent of the HPwES program, such as self-installed measures.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No changes to methodology.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Weatherization Assistance Program projects are tracked separately and there may be limited double-counting with HPwES, but the overlap is minimal. Incentives and funding included in

the Inflation Reduction Act may spur some growth in the number of homes meeting the performance standard, which could be attributable to HPwES if states (or their utilities) become Sponsors using IRA funding.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Manufactured Homes Regulatory Program

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
The standards implemented by this program have not yet taken effect, so the emissions reductions in 2022 are zero.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
Annual emissions reductions in 2030 are 460 metric kt of CO_2 and 3.7 metric kt of CH_4. Using a GWP value of 28 for CH_4, the combined emissions reduction in 2022 is 563.6 kt CO_2 eq.

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
The Energy Independence and Security Act of 2007 (Pub. L. 110-140) directs the U.S. Department of Energy to establish energy conservation standards for manufactured housing. DOE published a final rule on May 31, 2022 to establish energy conservation standards for manufactured housing.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Emissions reductions are calculated from the starting year of the standard.

Emissions Estimation Approach

Which gases are measured?
The GHG gases included in the analyses are CO_2 and CH_4.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Emissions reductions are estimated from modeling (Annual Energy Outlook using NEMS). Energy savings (in quads) resulting from an energy conservation standard are combined with emission factors appropriate to the sector and end use of the appliance or equipment, in order to estimate emissions reductions.

What approaches are used to ensure data quality, if any?
No specific additional steps are implemented. AEO and NEMS are ubiquitous tools used in the energy systems modeling community.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
These estimates reflect the effects of all implemented policy actions under these programs.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No. The methodology accounts for all domestic energy/emissions savings from the usage of a given appliance or equipment, but there may be spill-over effects in other international markets or jurisdictions. These effects are not analyzed.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
There are no key changes to the methodology for these programs.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
There are no other Federal programs for which emissions would be double counted with this program, so the GHG emission reduction estimates do not need to account for this.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Better Buildings Initiative, Better Climate Challenge

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
28,000 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
37,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
No key differences between methodologies.

Timeframe

In what year did the program start?
2011

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
The base year for emissions reductions is based on the year participating partners chose as their baseline when they joined the program (2011 is used if the partner baseline was before 2011). Within the Better Buildings Initiative, the Better Buildings Challenge (Energy Use Intensity reduction) began in 2011 and the Better Climate Challenge (emissions reduction) began in 2021.

Emissions Estimation Approach

Which gases are measured?
Multiple

For non-CO_2 gases, what GWP values were used?
Partners that report non-CO_2 gases calculate their own greenhouse gas inventories and report to DOE. They are encouraged to use the most recent IPCC Assessment Report for GWP values.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Better Buildings Challenge program partners share portfolio-wide actual energy consumption by year. Better Climate Challenge program partners share portfolio-wide actual greenhouse gas emissions and energy consumption by year. Data is self-reported by partners.

What approaches are used to ensure data quality, if any?
Program staff review partner data submissions for data quality, including checking for outliers or unusual results in facility-level energy intensity data, or confirming reasonableness of portfolio-level greenhouse gas inventory data. In some cases, program staff provide technical assistance with energy savings and greenhouse gas calculations, allowing for more direct assurance of data quality.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Just some. The program tracks reduction in energy consumption and GHG emissions reduction for program partners, and the program offers tools and technical assistance to amplify best practices in energy management, which are available to the broader commercial building market. GHG emissions reflect program participants' reductions but do not estimate impacts in the larger market from the deployment of tools and best practices.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No key changes.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The program's methodology captures all energy savings achieved by program partners. It is possible that these program partners are influenced by other federal policies and measures. The methodology does not adjust for potential double counting.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

Projected linear increase in growth of partners from 2019 to 2030 is assumed, which equates to a 50% increase in the number of program partners over that time period.

BIL Cost-Effective Codes Implementation for Efficiency and Resilience (BIL Section 40511)

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Building Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
9,400 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
The BIL was passed in November 2021. BIL Section 40511 provides $225 million supporting the adoption and implementation of building energy codes with appropriations beginning in FY22 (i.e., $45M/yr FY22 through FY26).

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
A start year of 2010 was chosen in order to align with modeling of base Building Energy Codes Program activities (which is a separate line item). Estimated BIL impacts are quantified by increasing adoption and compliance assumptions within the standard impact model. Previous benefits from state and local codes improvements through construction prior to 2010 are not included.

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, and N_2O

For non-CO_2 gases, what GWP values were used?

The 100-year GWP values from the IPCC Fifth AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Estimated from computer modeling of building codes, U.S. climates, industry data, and emissions factors.[14]

Note that the above report describes the methodology used here but does not quantify the impacts for BIL-related activities. This calculation was performed separately based on savings expected through increase code adoption and compliance.

The projected savings also include impacts on the existing building stock, since existing buildings are included within the scope of the BIL Section 40511 initiative. This also differs from the base programmatic estimates and referenced methodology, which are based on projected new construction and do not attribute savings to existing buildings as a conservative approach (though they certainly do occur in application of building codes). The savings attributed to existing buildings are estimated based on research published by the American Council for an Energy Efficient Economy.[15]

Site energy savings estimates were developed by DOE by code version and by state for both residential and commercial building codes, using computer modeling (EnergyPlus) and standard set of building models and U.S. climates. Building new construction estimates were developed using industry data (FW Dodge). Adoption rate assumptions at state level were based on historical data on state adoption speed. Realization factors (e.g., compliance) used in going from EnergyPlus modeled savings estimates to predicted savings in actual constructed buildings. Emission factors are marginal emission factors developed originally for DOE's AESP based on analysis of DOE/EIA 2022 Annual Energy Outlook publication and data tables/files to derive marginal emission factors for electrical grid energy reductions year by year through 2050. Emission factors for site fossil fuel combustion from EPA. Note. Savings estimates do not include estimates from states whose energy codes are significantly different than the model codes (90.1, International Energy Conservation Code) that DOE's efforts primarily address, nor do the estimates account for all alterations and additions to existing buildings that may also be impacted by building codes.

What approaches are used to ensure data quality, if any?
Methodology and calculations undergo significant internal review and are published in an external technical report, which is updated regularly to coincide with updated editions of the national model energy codes. Analysis estimates reflect engineering judgment for modeling of

code-impacts, use of standardized suite of building model and climates, and internally developed weighting factors. Emission factor estimates are national based on EIA's AEO and NEMS tool and are identical to those used in DOE's AESP.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most. The savings estimates are a based on modeled historical improvement in building driven energy consumption and historical adoption rates. Higher adoption and compliance rates could come from more aggressive/program policy efforts and have the potential to further increase savings beyond base programming.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
Generally, no. The estimate is for code adoption of the updated ASHRAE 90.1 or IECC codes. Further the analysis focuses on energy consumption related (operational) emission and does not take into account lifecycle/embodied carbon increases or reductions in societal emission that might occur due to updated building codes or related federal actions.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Only slight updates to the calculation methodology including updates to the development of marginal electric grid emission factors consistent with the DOE/EIA 2022 Annual Energy Outlook. BIL-related emissions savings were no reported previously but are congruent with the referenced methodology.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes. The estimate is developed to specifically avoid double counting the impact of higher equipment standards (AESP program related) emission benefits, as well as rulemaking activities for federal buildings and additional savings expected as the result of BIL funding supporting building energy codes.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
For the 2030 GHG reduction estimate, CO_2 accounts for 7,800 kt CO_2 eq of the total 9,400 kt CO_2 eq. These estimates represent expected emissions reductions in residential and commercial buildings as the result of enhanced activities supporting building energy code

advancement—i.e., incremental improvement over the base Building Energy Codes Program scenario.

Weatherization Assistance Program

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: U.S. Department of Energy

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
38.78 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
80.55 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
No differences

<u>**Timeframe**</u>

In what year did the program start?
1976

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2022

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CO_2, CH_4, N_2O

For non-CO_2 gases, what GWP values were used?
For Electricity - NREL's Cambium database is used for current and projected grid-based electricity emissions factors and combines CO_2 and non-CO_2 gases into CO_2 eq based upon GWP.

For All Other fuel types – EPA's Greenhouse Gas Equivalencies Calculator emission factors are assumed to be constant over time and combines CO_2 and non-CO_2 gases into CO_2 eq based upon GWP.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Impacts are based on a detailed program evaluation study[16] that utilizes direct measurements of energy savings from a statistical sample of program participants. This provides an estimate of the GHG emissions savings per weatherized home. Emissions reductions from electricity are updated using latest emissions rate projections.[17]

What approaches are used to ensure data quality, if any?
Peer-review of impact evaluation studies.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
No

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No

Critical Materials Innovation Hub – GALVANIX

Sector(s) Affected: Energy: Industrial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Advanced Materials & Manufacturing Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
0.0021 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2021

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2025

Emissions Estimation Approach

Which gases are measured?
CO_2, perfluorocarbons (PFC)

For non-CO_2 gases, what GWP values were used?
See methodology explanation below

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Galvanix Inc., a small business and Team member of the Critical Materials Innovation Hub (CMI Hub), is focused on commercializing a novel process for producing neodymium (Nd), a critical component of rare-earth magnets. Nd production using the conventional molten salt

electrolysis (MSE) process, the baseline process for this PAM's GHG emission reduction calculations, produces 141-156 kg CO_2 eq per kg of Nd (cradle-to-gate, combination of CO_2 and perfluorocarbons). The novel process developed through the CMI Hub uses produces 136 kg CO_2 eq per kg of Nd, a reduction of 15-20 kg CO_2 eq per kg relative to the conventional MSE process. Assuming Galvanix produces 120 kg of Nd in 2030, this will constitute a GHG emission reduction (relative to conventional Nd production baseline) of 1,800-2,400 kg CO_2 eq, or 0.0018-0.0024 kt CO_2 eq. The estimate provided above is the average of this range.
Assumptions:

- Reduction: 15-20 kg CO_2 eq/kg of Nd metal produced—from cradle to gate, new process reduces GHG emissions from 141-156 kg CO_2 eq to 136 kg CO_2 eq per kg of Nd[18]
- 120 kg Nd metal produced in 2030 (10 kg/month production levels)[19]

What approaches are used to ensure data quality, if any?
N/A

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Some. If the company is successful, they will likely scale up their production levels greater than the assumed levels in this exercise.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
Life-cycle assessment was performed looking across several categories including ozone depletion, global warming, smog, acidification, eutrophication, carcinogenicity vs. non-carcinogenicity, respiratory effects, ecotoxicity, and fossil fuel depletion.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The U.S. has targets for clean energy technology deployment that require neodymium metal, including 50% electric vehicle adoption and 30 GW offshore wind by 2030. This assessment does not double count GHG emissions being reduced by the deployment of those technologies and limits emission reduction estimates to only the embodied energy of the metallization step

needed to produce the NdFeB magnets used in clean energy technologies such as electric vehicle traction motors and offshore wind turbine generators.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Critical Materials Innovation Hub – Rio Tinto

Sector(s) Affected: Energy: Industrial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Advanced Materials and Manufacturing Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
0.00498 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
2.49 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Production levels in 2022 and 2030 are assumed to be different (10 metric tonnes Li_2CO_3 in 2022; 5000 metric tonnes per year from 2023-2030).

Timeframe

In what year did the program start?
2019

If emission reductions were estimated using a year other than the start year as the “zero” point for reductions, what was that year?
2022

Emissions Estimation Approach

Which gases are measured?
CO_2 eq

For non-CO_2 gases, what GWP values were used?
See methodology explanation below.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Rio Tinto, a business and Team member of the Critical Materials Innovation Hub (CMI Hub), is working on scaling up production of battery-grade lithium, in the form of Li_2CO_3, using a new

direct lithium extraction (DLE) process that extracts lithium from mine tailings. As a baseline, this methodology compares the GHG emissions of Li_2CO_3 production from the DLE process, developed through the CMI Hub, to those of conventional Li_2CO_3 production from salt flat brines (1.800 kg CO_2 eq/kg of Li_2CO_3) and spodumene (1.610 kg CO_2 eq/kg of Li_2CO_3). A life cycle assessment study of the DLE process' application to extract Li_2CO_3 from geothermal brines was conducted, suggesting the GHG emissions of this process were 1.21 kg CO_2 eq/kg of Li_2CO_3. The calculations herein assume that applying the same process to mine tailings will yield roughly equivalent GHG emissions. The source that provided these GHG emissions, cited below in the assumptions section, did not break these GHGs down into their constituent gases.

Relative to the two conventional Li_2CO_3 production processes, the DLE process reduces GHG emissions by 0.397-0.587 kg CO_2 eq per kg of Li_2CO_3 produced. An estimated 10 metric tonnes of Li_2CO_3 were produced at a demonstration plant in 2022, and an estimated 5,000 metric tonnes could be produced at a production-scale plant in 2030. This corresponds to GHG reductions, relative to the conventional process baseline, of 0.00397-0.00587 kt CO_2 eq in 2030 and 1.99-2.94 kt CO_2 eq in 2030. The estimates provided above are the averages of these ranges.

Assumptions:

- Reduction: 0.397 to 0.587 kg CO_2 eq/kg of Li_2CO_3 produced
- 2022 production levels (demonstration plant): 10 metric tonnes
- 2030 production levels (production-scale plant): 5000 metric tonnes[20]
- CO_2 savings realized by applying the technology to geothermal brines is roughly equivalent to applying the technology to mine tailings.
- Rio Tinto is producing Li_2CO_3 (as opposed to LiOH).

What approaches are used to ensure data quality, if any?

N/A

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

Some. If the technology were to be applied to geothermal brines production at the Salton Sea to produce LiOH, which resulted in even higher GHG emission reductions relative to conventional LiOH production when the DLE process was applied to extract LiOH from geothermal brine, the GHG emission reductions would presumably be higher.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

Life-cycle assessment was performed looking across several categories including ozone depletion, global warming, smog, acidification, eutrophication, carcinogenics, non carcinogenics, respiratory effects, ecotoxicity, and fossil fuel depletion.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The US has targets for clean energy technology deployment that require lithium carbonate including 50% electric vehicle adoption. This assessment does not double count GHG emissions being reduced by the deployment of those technologies and limits the evaluation to only to the embodied energy of the produced lithium carbonate used to manufacture lithium-ion batteries needed for clean energy technologies such as electric vehicle traction motors.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Critical Materials Innovation Hub – TdVib

Sector(s) Affected: Energy: Industrial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Advanced Materials and Manufacturing Technologies Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
5.0 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2018

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2023

Emissions Estimation Approach

Which gases are measured?
CO_2 eq

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
TdVib, LLC, a small business and Team member of the CMI Hub, is commercializing an innovative method "acid-free dissolution recycling or ADR" developed through the CMI Hub of recycling rare earth metals from the high-powered magnets in electronic waste. Their

published research has thus far focused on recycling hard disk drives. As a baseline, the methodology compares the GHG emissions of this new method to those of the conventional method of shredding whole hard disk drives at the end of life. Compared to the conventional method, the ADR method reduces GHG emissions by 3.70 kg CO_2 eq per hard disk drive recycled. The company aims to be able to produce three to five metric tonnes of rare earth oxides within the next two years.

Assuming TdVib achieves this production capacity in 2030 exclusively from hard drives, each hard drive contains 2.5-4.6 g rare earth elements, and the efficiency of the recycling process is 99%, obtaining 3 tons of rare earth elements would take 0.659-1.21 million hard drives, corresponding to 2.4-4.5 kt CO_2 eq. Obtaining 5 tons of rare earth elements would take 1.10-2.02 million hard drives, corresponding to 4.1-7.5 kt CO_2 eq, making the total range 2.4-7.5 kt CO_2 eq. The 2030 GHG emission reduction estimate provided above is the average of this range.

Assumptions:

- Reduction: 3.7 kg CO_2 eq/hard disk drive recycled[21]
- 2030 production levels: 3 to 5 metric tonnes per year[22]
- Assumes all rare earth oxide is produced from recycling of hard disk drives
    - Conversion factor: 2.475g to 4.554g rare earth oxide recycled per hard disk drive
        - 2.5 – 4.6 g rare earth element contained per hard disk drive[23]
        - Recycled efficiency = 99% (based on knowledge of recycling process)

What approaches are used to ensure data quality, if any?

N/A

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

Some. The company licensing the technology has the option to sub-license, which could expand the material recycled and therefore the GHG emission reductions.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

N/A

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?

N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

The US has targets for clean energy technology deployment that require rare earth oxide including 50% electric vehicle adoption and 30 GW offshore wind by 2030. This assessment does not double count GHG emissions being reduced by the deployment of those technologies and limits the emission reduction estimate only to the embodied energy of the extraction and separation step of rare earth oxides needed to produce NdFeB magnets used in clean energy technologies such as electric vehicle traction motors and offshore wind turbine generators.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Better Plants, Better Climate Challenge

Sector(s) Affected: Energy: Industrial End-Use

Implementing Entity: U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy, Industrial Efficiency and Decarbonization Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2024?
55,000 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
67,000 kt of CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
No key differences between methodologies.

Timeframe

In what year did the program start?
The Better Plants program began in 2009 and Better Plants Challenge began in 2011. Partners set voluntary goals for increases in energy efficiency (reduction in energy intensity). The Better Climate Challenge began in 2021. Partners set voluntary goals for reductions in GHG emissions. Many partners participate in both, so this entry groups them together to avoid double-counting.

If emission reductions were estimated using a year other than the start year as the “zero” point for reductions, what was that year?
The base year for emissions savings is based on the year participating partners chose as their baseline when they joined the program (2011 is used if the partner baseline was before 2011).

Emissions Estimation Approach

Which gases are measured?
All

For non-CO_2 gases, what GWP values were used?
Partners that report non-CO_2 gases calculate their own greenhouse gas inventories and report to DOE. They are encouraged to use the most recent IPCC Assessment Report for GWP values.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Better Plants program partners share portfolio-wide actual energy consumption by year. Better Climate Challenge program partners share portfolio-wide actual greenhouse gas emissions and energy consumption by year. Data is self-reported by partners.

What approaches are used to ensure data quality, if any?
Program staff review partner data submissions for data quality, including checking for outliers or unusual results in facility-level energy intensity data, or confirming reasonableness of portfolio-level greenhouse gas inventory data. In some cases, program staff provide technical assistance with energy savings and greenhouse gas calculations, allowing for more direct assurance of data quality.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Just some. The program tracks reduction in energy consumption and GHG emissions reduction for program partners, and the program offers tools and technical assistance to amplify best practices in energy management and emissions reduction, which are available to the broader industrial market.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No key changes

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The program's methodology captures all energy savings achieved by program partners. It is possible that these program partners are influenced by other federal policies and measures. The methodology does not adjust for potential double counting.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

Projected linear increase in growth of partners from 2019 to 2030 is assumed, which equates to a 50% increase in the number of program partners over that time period.

Carbon Capture & Carbon Storage Programs

Sector(s) Affected: Cross-cutting, Industrial Processes and Product Use

Implementing Entity: U.S. Department of Energy – FECM

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
1,210 kt CO_2 eq (carbon capture program)
430 kt CO_2 eq (carbon storage program)

- Carbon Capture Program: Partners with National Laboratories, universities and industry on research, development, demonstration, and deployment (RDD&D) to be applied to a wide variety of sources such as power plants, cement and steel facilities, refineries, petrochemical facilities, and other sources. (RDD&D is focused on adapting technologies or making them robust enough to capture greater than 95% of the CO_2 emissions from these wide variety of sources including front-end engineering design studies for power and industrial facilities.
- Carbon Storage Program: Partners with National Laboratories, universities and industry for CO_2 conversion to fuels, organic and inorganic chemicals, food and feeds, construction materials, energy storage, wastewater treatment, and other applications.

These estimates are based on three DOE-funded projects; however, one of the projects was not in operation in 2022 and therefore was not included in the 2022 estimates associated with these programs. The 2022 estimate for one of the projects is attributed to both the capture program and the storage program since it spans both programs by capturing and geologically storing CO_2.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
N/A. DOE expects to see an increase in carbon capture amounts over time but cannot reliably extrapolate these estimates at this time.

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2002. (Both programs started in 2002).

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?

The estimate is based on measured carbon capture injection rates which have been recorded since the first full year the projects began operations. From three demonstration projects, relevant recorded parameters include total CO_2 capture, quarterly change, average annual CO_2 injection rates. The estimate uses quarterly total CO_2 captured for the four quarters of 2022. One project (of three total) was not in operation during 2022 and thus was not included in the carbon capture rate estimate.

<u>Emissions Estimation Approach</u>

Which gases are measured?

CO_2

For non-CO_2 gases, what GWP values were used?

N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

The estimates are based on direct measurements (metered).

What approaches are used to ensure data quality, if any?

The data used are verified by the reporting facilities and reported to DOE and to EPA's Greenhouse Gas Reporting Program.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

N/A

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?

N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

N/A.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

BIL Carbon Dioxide Transportation Infrastructure Finance and Innovation Program (Sec 40304)

Sector(s) Affected: Industrial Processes and Product Use

Implementing Entity: U.S. Department of Energy

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A. The Carbon Dioxide Transportation Infrastructure Finance and Innovation Act (CIFIA) program was created under the BIL, which was enacted in 2021. Therefore, there were no estimated GHG emissions reductions in 2022.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
35,347 kt CO_2 eq.

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
The CIFIA program was established by Section 40304 of the Infrastructure Investment and Jobs Act, Public Law 117-58, signed November 15, 2021, also known as the BIL.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

For CIFIA projects, given that the program is focused on CO_2 transportation infrastructure, the GHG reduction estimate can be based directly on the amount of CO_2 transported, assuming the disposition of the CO_2 is permanent sequestration. These values would be reported by the project applicant. If the CO_2 disposition is utilization, the GHG impact estimates would follow a similar process for most Section 1703 Loan Guarantee Program evaluations. A life cycle analysis (LCA) is performed to quantify the GHG intensity of the project's products over their lifecycle. The base inputs are provided by the project applicant in a process flow sheet[24] that must mass balance and which includes projected emissions. The GHG intensity is then compared with the GHG intensity of equivalent production in a business-as-usual (BAU) case, which are based off inputs from a variety of sources. A common functional unit, specific to each analysis, is used to allow equivalent comparison between the proposed project case and the BAU case.

Data sources used to build up the BAU case include:

- Federal LCA Commons – NREL, National Energy Technology Laboratory (NETL), Argonne National Laboratory (ANL), USDA, EPA, Forest Service, Federal Highway Administration, universities[25]
- openLCA[26]
- NETL Unit Process Library[27]
- NETL CO2U openLCA LCI Database[28]
- Sphera databases[29]
- ecoinvent databases[30]

What approaches are used to ensure data quality, if any?

Data quality for the projected results are ensured through the following approaches:

- Site visits and periodic conference calls between the borrower and LPO to verify and validate facilities are operating in accordance with the obligations under the terms and conditions of the loan guarantee agreement (LGA).
- Project reporting in line with program and loan requirements
- Modeling and simulation
- Industry reports, market analysis and other federal estimates.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

The quantified GHG emission reduction estimates reflect all the projected effects from the CIFIA program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

This methodology used does not reflect impacts outside the boundaries of the life-cycle analysis. However, it is expected that other sectors will be accounted for within the LCA boundaries due to the sources of the CO_2.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
LPO loans are for project-specific costs. DOE is not aware of any other federal policy attributing GHG impacts from our projects.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
Given the CIFIA program was implemented in November 2021, projects financed under this loan authority have not yet reached operation and there continues to be a continuously evolving pipeline of projects anticipated to be in operation by 2030. There is only one project in the LPO pipeline representative of a CIFIA project. The estimated GHG reduction provided above is based on a build up of that representative project, which builds the basis of a "dollar loan to ton GHG reduced" ratio. Assuming that all financed projects are in operation that year, this ratio is applied to the projected loan authority expected to be obligated by 2030 to yield the GHG reduction estimate. Due to the program's slow adoption rate given several project development barriers to large scale CO_2 transportation infrastructure projects, 50% of the total CIFIA loan authority is assumed to be exhausted by 2030.

Section 1703/1705 Loan Guarantee Program

Sector(s) Affected: Cross-Cutting

Implementing Entity: U.S. Department of Energy – Loan Programs Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
3,831 kt CO_2 eq.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
250,745 kt CO_2 eq.

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
The methodology and assumptions used have not changed between reports.

Timeframe

In what year did the program start?
The section 1703 Loan Guarantee Program was authorized under section 1703 of the Energy Policy Act of 2005. LPO notes that the 2030 estimates include new funding provided by the IRA to the 1703 program.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Emissions reduction estimates for 1703 projects utilize comparisons against "business-as-usual" cases. These cases are derived from numerous databases, containing data updated at various intervals. As a result, there is no single "zero" point that can be identified for these estimates.

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

For single-site projects, the GHG impact estimates follow a similar process for most Section 1703 Loan Guarantee Program evaluations. An LCA is performed to quantify the GHG intensity of the project's products over their lifecycle. The base inputs are provided by the project applicant in a process flow sheet[31] that must mass balance and which includes projected emissions. The product's GHG intensity is then compared with the GHG intensity of equivalent production in a business-as-usual (BAU) case, which are based off inputs from a variety of sources. A common functional unit, specific to each analysis, is used to allow equivalent comparison between the proposed project case and the BAU case. The LCA system boundary may be set on a cradle-to-grave or cradle-to-gate basis, depending on the certainty of the product's final disposition and the availability of data to evaluate the emission impacts of those pathways. For supply chain projects, the GHG reductions from each unit (i.e. a photovoltaic panel) produced in a year includes the summation of reductions for the entire life span and operational cycle characteristics of the unit produced. For distributed energy projects, the GHG reductions from the deployed assets is based on the avoided emissions from the reduced use of grid electricity and accounts for the embodied emissions of the deployed assets.

Data sources used to build up the BAU case include:

- Federal LCA Commons – NREL, NETL, ANL, USDA, EPA, Forest Service, Federal Highway Administration, universities[32]
- openLCA[33]
- NETL Unit Process Library[34]
- NETL CO2U openLCA LCI Database[35]
- Sphera databases[36]
- ecoinvent databases[37]

What approaches are used to ensure data quality, if any?

Data quality for the projected results are ensured through the following approaches:

- Site visits and periodic conference calls between the borrower and LPO to verify and validate facilities are operating in accordance with the Projects' reporting obligations under the terms and conditions of the LGA.
- Project reporting in line with program and loan requirements
- Modeling and simulation
- Industry reports, market analysis and other federal estimates.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

The quantified GHG emission reduction estimates reflect all of the projected effects from the 1703 program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
This methodology used does not reflect impacts outside the boundaries of the life-cycle analysis.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
The methodology used to determine the estimate has not changed from prior reports.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
LPO loans are for project-specific costs. DOE is not aware of any other federal policy attributing GHG impacts from our projects.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

IRA Energy Infrastructure Reinvestment Financing

Sector(s) Affected: Cross-Cutting

Implementing Entity: U.S. Department of Energy – Loan Programs Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
The 1706 Energy Infrastructure Reinvestment (EIR) program was created under the IRA. Therefore, there were no estimated GHG emissions reductions in 2022.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
66,753 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
The EIR Program was authorized under section 1706 of the Energy Policy Act of 2005, as amended (42 U.S.C. 16517) in August 2022.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Emissions reduction estimates for 1706 EIR utilize comparisons against "business-as-usual" cases. These cases are derived from numerous databases, containing data updated at various intervals. As a result, there is no single "zero" point that can be identified for these estimates.

Emissions Estimation Approach

Which gases are measured?
CO2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

For single-site projects, the GHG impact estimates follow a similar process for most Section 1703 Loan Guarantee Program evaluations. An LCA is performed to quantify the GHG intensity of the project's products. The base inputs are provided by the project applicant in a process flow sheet[38] that must mass balance and which includes projected emissions. The product's GHG intensity is then compared with the equivalent production in a business-as-usual (BAU) case, which are based off inputs from a variety of sources. A common functional unit, specific to each analysis, is used to allow equivalent comparison between the proposed project case and the BAU case. The LCA system boundary may be set on a cradle-to-grave or cradle-to-gate basis, depending on the certainty of the product's final disposition and the availability of data to evaluate the emission impacts of those pathways.

Data sources used to build up the BAU case include:

- Federal LCA Commons – NREL, NETL, ANL, USDA, EPA, Forest Service, Federal Highway Administration, universities[39]
- openLCA[40]
- NETL Unit Process Library[41]
- NETL CO2U openLCA LCI Database[42]
- Sphera databases[43]
- ecoinvent databases[44]

For regulated utility EIR evaluations (particularly baseload electric generation projects) which may contain multiple project sites, the analyses compare the emissions factor for the new proposed power generation projects against the emissions factor for the marginal grid mix for the pertinent region. The emissions factor for each individual project component is compared to the emissions factor based on the marginal grid mix for the pertinent region and the overall impact is summed. Analyses of individual project components are mainly based on data provided by the applicant, but other data sources may be used when applicant data is not available. NETL's Grid Mix Explorer tool is used to determine the marginal grid mix for the BAU. For the impact of battery energy storage, battery capacity factors are assumed based on the proposed battery durations and discharge cycles, and the GHG intensity of the battery storage is assumed at the GHG intensity of the overall power grid.

What approaches are used to ensure data quality, if any?

Data quality for the projected results are ensured through the following approaches:

- Site visits and periodic conference calls between the borrower and LPO to verify and validate facilities are operating in accordance with the project's reporting obligations under the terms and conditions of the LGA.
- Project reporting in line with program and loan requirements
- Modeling and simulation

- Industry reports, market analysis and other federal estimates.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The quantified GHG emission reduction estimates reflect all the projected effects from the 1706 EIR program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
This methodology used does not reflect impacts outside the boundaries of the life-cycle analysis.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
LPO loans are for project-specific costs. DOE is not aware of any other federal policy attributing GHG impacts from our projects.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
Given the 1706 EIR program was implemented in August 2022, projects financed under this loan authority have not yet reached operation and there continues to be a continuously evolving pipeline of projects anticipated to be in operation by 2030. The estimated GHG reduction provided above is based on a build-up of representative projects, which build the basis of a "dollar loan to ton GHG reduced" ratio. Assuming that the loan authority is exhausted by 2030 and all financed projects are in operation in that same year, this ratio is applied to the total projected loan authority of the program to yield the GHG reduction estimate. Loan agreements under the 1706 EIR program must be executed by September 2026, and all funds from this program must be disbursed by September 2031.

For the estimates in this BTR, it was assumed that there is $60 billion in 1706 loan authority available based on available credit subsidy (rather than the $250B statutory limitation).

IRA Tribal Energy Loan Guarantee Program

Sector(s) Affected: Cross-Cutting

Implementing Entity: U.S. Department of Energy – Loan Programs Office

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
There were no executed Tribal loans in the Loan Program in 2022; therefore, there were no estimated GHG emissions reductions in 2022.

If available, what is the estimate of GHG emission reductions expected in the year 2030?
2,811 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
On July 26, 2018, the U.S. DOE released the Tribal Energy Loan Guarantee Program, which can guarantee up to $2 billion in loans to support economic opportunities for American Indian tribes via energy development projects. The Inflation Reduction Act (Sec. 50145) provides $20 billion in loan authority for the Tribal Energy Loan Guarantee Program. The Inflation Reduction Act makes direct loan authority permanent under the Act.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Emissions reduction estimates for Tribal energy-related projects utilize comparisons against "business-as-usual" cases. For renewable energy produced from solar power the business-as-usual case is the average national grid emission rate for the fleet of generation facilities. The average grid emission rate is updated at various intervals. As a result, there is no single "zero" point that can be identified for these estimates.

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
For Tribal projects, the GHG impact estimates utilize the average national grid emission rate for the fleet of generation facilities as the BAU case compared against the emission rate for generation in the project. The estimate is based on the current pipeline of renewable energy produced from solar power, however, the pipeline will evolve over time. Estimates for solar generation are based on data provided by the applicants and other data sources may be used when applicant data is not available including modeling and simulation, industry reports, market analysis, and federal estimates.

Data sources used to build up the BAU case include:

- US Energy Information Administration (EIA):
  - CO_2 emissions from energy consumption[45]
  - Net Generation by Energy Source[46]

The BAU case uses static average grid emissions rates from the start year of a project. Average grid emissions factors are expected to change through 2030 and this may increase or decrease GHG impacts.

What approaches are used to ensure data quality, if any?
Data quality for the projected results are ensured through the following approaches:

- Site visits and periodic conference calls between the borrower and LPO to verify and validate facilities are operating in accordance with the project's reporting obligations under the terms and conditions of the LGA.
- Project reporting in line with program and loan requirements
- Modeling and simulation
- Industry reports, market analysis and other federal estimates.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The quantified GHG emission reduction estimates reflect all the projected effects from the Tribal program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
This methodology used does not reflect impacts outside of the primary sector.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
LPO loans are for project-specific costs. DOE is not aware of any other federal policy attributing GHG impacts from our projects.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
The Tribal program was initially funded in 2018, with subsequent funding in 2022 but the projects under the loan authority have not yet reached operation. The type of project and associated GHG emission profile most likely to reach operation within the program is based on the project currently the furthest through the loan process, however, the project pipeline will continue to evolve. As a result, renewable energy produced from solar power was used to represent what is anticipated to be in operation by 2030. The estimated GHG reduction provided above is based on a scale-up of that indicative project to represent a group of projects anticipated to be in operation by 2030. The indicative project was used as the basis for a "dollar loan to ton GHG reduced" ratio. Assuming that the loan authority is exhausted by 2030 and all financed projects are in operation in that same year, the dollar loan to ton GHG reduced ratio is applied to the total projected loan authority of the program to yield the GHG reduction estimate in 2030.

U.S. Department of Energy – Explanations of Unavailable GHG Emissions Reduction Estimates

Some offices at the Department of Energy are unable to provide a GHG emissions reduction estimate for their programs. The reason for this is several fold. Several programs are focused on research and development which potentially unlocks technology advancements that will reduce GHG emissions in the future, but whose impact is difficult to quantify at the research and development stage. Other policies and measures enable GHG reductions, but don't directly reduce GHG emissions themselves. For instance, there are several measures that are focused on workforce development which will ensure that the workforce is properly trained for clean energy deployment whereas others focus, for example, on grid infrastructure upgrades that enable the electricity grid to handle new clean energy generation additions. Finally, some policies and measures don't currently collect the information necessary to calculate their GHG emission reduction impact or a program may be too new to have finalized projects to assess GHG impacts.

HUD Minimum Energy Standards

Sector(s) Affected: Energy: Residential & Commercial End Use

Implementing Entity: U.S. Department of Housing and Urban Development

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
1,059 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2024. HUD jointly with USDA adopted minimum energy standards for a range of housing programs in April 2024. Covered units are required to build to the 2021 IECC and ASHRAE 90.1-2019.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?

2026. The agencies provided a 6-18 month compliance/implementation period for the new energy standards; 2026 is used as the first year where energy and resulting emissions savings are anticipated.

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

HUD uses reduction in Energy Use Intensity (BTUs/sf) estimated by the Pacific Northwest National Laboratory for the 2021 IECC relative to prevailing state codes (either the 2009 IECC or the 2018 IECC) – an average reduction of 9.35%. We used RECS data to estimate energy consumption of HUD-assisted households, based on housing type and income. We account for rebound effects of 10-30% (increase in energy consumption after energy efficiency improvements), and multiply the number of housing units impacts x energy consumption x % energy reduction x (1-rebound rate) x CO2 emissions factor x # of years. The CO_2 emission factor is calculated using a weighted average of the emission coefficients for each fuel oe power source used for residential energy (Energy Information Administration and EPA GHG Emission Factors Hub). The weighted average mission factor used is: 0.09347 mt CO_2/MMBtu (or 93.47 kg CO_2/MMBtu)

What approaches are used to ensure data quality, if any?
CO_2 are estimates using standard methodology and EPA and EIA emissions factors. HUD used a modified DOE methodology to derive energy savings.[47]

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
Methodology assumes direct effects on the primary sector (residential housing impacted by this PAM).

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A. This is the first time HUD has reported this measure.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The U.S. Department of Energy promotes adoption of similar energy codes by states and local jurisdictions. See DOE's Building Energy Codes Program in this Annex. While HUD and USDA adoption of minimum energy standards means that new buildings will be built to above-prevailing state codes, the emission reductions resulting from this initiative may be included in the DOE estimates.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

U.S. Department of Housing and Urban Development – Explanations of Unavailable GHG Emissions Reduction Estimates

For most programs, HUD does not require reporting of energy savings by grantees or borrowers, and therefore does not track or report energy savings and resulting emissions reductions. One exception is for updated minimum energy codes, for which HUD develops energy savings and carbon reduction estimates.

Onshore Renewable Energy Development Program

Sector(s) Affected: Energy: Supply

Implementing Entity: Department of the Interior, Bureau of Land Management and Bureau of Indian Affairs

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
62,839 kt CO_2 eq
If available, what is the estimate of GHG emission reductions expected in the year 2030?
170,300 kt CO_2 eq
If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
For the 2030 estimate, it is assumed that 60 GW of onshore renewable energy would be permitted by 2030 and was based on proposed legislation that suggested this national goal. It is also assumed that the ratio breakdown of technology type permitted MW capacity in 2030 would be the same ratio as what has been permitted through 2022.

Timeframe

In what year did the program start?
The Bureau of Land Management (BLM) began permitting geothermal energy in 1979, wind energy in 1980's and solar in 2010.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
As noted above, BLM began permitting geothermal energy in 1979, wind energy in 1980's and solar in 2010. This analysis estimate is based on the total renewable deployment in 2022 and then projects the impact of future deployment.

Emissions Estimation Approach

Which gases are measured?
This analysis determines the amount of greenhouse gases avoided through the deployment of renewable energy using EPA's Greenhouse Gas Equivalencies Calculator.[48] The Calculator estimates the tons of CO_2 equivalent avoided not the specific GHG emissions by gas avoided.

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
See tables below. For this analysis, the BLM used the approved megawatt capacity for each project (MW), the total hours in a year (hours per year) and an average capacity factor for each technology (net capacity factor) to multiply the megawatt-hours per year (MWh/yr) and then converts to kWh/year by multiplying by 1,000. The resulting kWh/year is entered into the EPA's Greenhouse Gas Equivalencies Calculator[49] to estimate the metric tons of CO_2 equivalent emissions avoided. The net capacity factor is the ratio of actual electrical energy output over the year to the theoretical maximum electrical energy output over the year presented as a percentage. This reflects the noncontinuous nature of renewable energy production.

2022 analysis: In 2022, the amount of CO_2 equivalent greenhouse gas avoided from the combined renewable energy projects permitted by the BLM and BIA is calculated as shown below based on using EPA's Greenhouse Gas Equivalencies calculator:

Technology Type	Total MW Capacity	Hours Per Year	Net Capacity Factor	MWh	kWh	kt CO_2 eq
Solar	18,522.66	8,760	25.10%	40,726,883.90	40,726,883,902	28,451
Wind	6,747.03	8,760	35.00%	20,686,393.98	20,686,393,980	14,451
Geothermal	3,832.70	8,760	85.00%	28,538,284.20	28,538,284,200	19,937
					Total kt CO_2 eq avoided as of 2022	**62,839**

2030 analysis: Using an estimate of 60 GWs of approved onshore renewables by 2030, and assuming the MW breakdown by technology will be the same ratio as what has been permitted through 2022 (45% solar, 23% wind, and 32% geothermal) the projected kilotons CO_2 equivalent avoided (estimated using EPA's Greenhouse Gas Equivalencies calculator) are as follows:

Technology Type	MW	Hours Per Year	Net Capacity Factor	MWh	kWh	kt CO_2 eq
Solar	27,165.88	8,760	25.10%	59,731,243.37	59,731,243,371	41,728
Wind	13,798.36	8,760	35.00%	42,305,756.82	42,305,756,821	29,554
Geothermal	19,035.77	8,760	85.00%	141,740,328.73	141,740,328,734	99,018

					Total kt CO_2 eq projected for 2030	170,300

What approaches are used to ensure data quality, if any?
BLM validates the megawatt capacity of projects it authorizes.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The estimates provided are anticipated to account for most of the Department of the Interior's GHG reductions from permitted renewable energy projects.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No, this analysis relies on EPA's Greenhouse Gas Equivalencies Calculator estimates of electricity emissions avoided through energy efficiency or renewable energy projects. Our estimate addresses that direct effect of the deployment of renewable energy.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
This analysis relies on EPA's Greenhouse Gas Equivalencies Calculator.[50] The equivalencies in the Calculator are reported as CO_2 equivalents (CO_2-eq) and are calculated using global warming potentials from the IPCC AR5.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
It is possible that other agencies are reporting GHG emissions avoided from the purchase of electricity derived from renewable energy sources and that energy has been generated on BLM-managed lands. BLM lacks information about where energy produced on BLM-managed lands is ultimately used and therefore does not attempt to account for possible double counting.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
This analysis relies on EPA's Greenhouse Gas Equivalencies Calculator.[51]

Offshore Renewable Energy Program

Sector(s) Affected: Energy: Supply

Implementing Entity: U.S. Department of the Interior – Bureau of Ocean Energy Management (BOEM)

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
12.53 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
16,105.93 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
The expected reductions are based on the grid mix in 2019 (pre-COVID energy consumption effects). Changes to the grid mix and overall energy usage during this decade will affect GHG emission reduction estimates. The amount of emissions associated with construction and operations from vessel use varies by project and does not necessarily have a linear relationship with project capacity. The amount of avoided emissions varies due to the energy profile mix of the grid region in which a particular project connects.

Timeframe

In what year did the program start?
2009

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Avoided emissions are estimated based on the grid mix of each grid region in 2019.

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, and N_2O

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane, 265 nitrous oxide.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The estimates encompass offshore wind projects in Federal waters approved as of June 2024. The estimates for 2030 make assumptions about the timing of future offshore wind farm construction and operation based on the best available information.

The estimates are based on the lifetime GHG footprint of the offshore wind projects compared to the GHG footprint of the existing (2019) grid mix for the same amount of electricity. Data sources include the construction and operations plans and environmental impact statements of the offshore wind projects, the Environmental Protection Agency's Avoided Emissions and Generation Tool (AVERT), and grid information from the Energy Information Administration. Values for CH_4 and N_2O were estimated based off of US EPA emissions factors for diesel-burning marine vessels.

What approaches are used to ensure data quality, if any?
The offshore wind projects being permitted by the program are either new or not yet complete. A retrospective analysis of actual emissions from project construction and changes to the grid mix since 2019 and post-COVID effects would increase the accuracy of the estimates. Any delays to approved projects would affect these estimates.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
There are aspects that are not fully captured in the emission reduction estimates. While the comparison is being made between direct emissions of the existing grid and offshore wind, it does not include emissions associated with the upstream extraction of and transport of fuel or materials for any of the power sources. In a full life cycle framework, there are likely much greater GHG emission reductions than are being captured in this estimate (NREL life cycle assessment harmonization).[52] Also, it is possible that construction and decommissioning emissions from offshore wind are overestimated.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
The methodology used accounts for construction, annual operation, maintenance, and decommissioning emissions over the expected lifecycle of each offshore wind project. It does not account for the upstream extraction of raw materials or manufacturing of components prior to construction staging. As discussed above, avoided GHG emissions would likely be greater if upstream emissions were considered when compared to almost any other power generation alternative.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
This methodology conservatively accounts for decommissioning emissions, overseen by the Bureau of Safety and Environmental Enforcement. There may be overlap in port emissions (+) considered in emissions reduction estimates for offshore wind, reported by DOI/BOEM, and associated GHG emissions relating to port electrification, reported by the Department of Transportation. To the extent that is the case, GHG emission reductions could be underestimated as the port emissions from offshore wind activities would be counted twice.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
These reduction estimates are dependent on the offshore wind facilities functioning at their expected capacity factor. Unforeseen disruptions due to extreme weather events, the supply chain, permitting issues, or vessel availability that affects the construction schedules of the approved projects could reduce the expected 2030 avoided emissions.

Orphaned Wells Program

Sector(s) Affected: Energy: Supply

Implementing Entity: Department of the Interior

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
11.8 kt CO_2 eq (estimate for 2023 is applied for the 2022 reporting year)[53]

If available, what is the estimate of GHG emission reductions expected in the year 2030?
115.3 kt CO_2 eq (estimate for 2033 is applied for the 2030 reporting year)[54]

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

<u>**Timeframe**</u>

In what year did the program start?
1979, Bipartisan Infrastructure Law funding in 2021

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 methane

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
A combination of direct measurements of methane from wells pre- and post-plugging as self-reported by state and federal entities and emission factors and modeling by the Department of the Interior.[55]

What approaches are used to ensure data quality, if any?
The Federal program has published guidelines that recommend data measurement objectives and quality assurance criteria to meet federal program information needs for methane measurements and allow for aggregation. Data quality is also ensured by rigorous analyses by Orphaned Well Program data scientists to detect potential errors.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Some – not all orphaned wells emissions were measured.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No. The methodology accounts only for the direct impact of plugging orphaned wells.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
No.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
No.

U.S. Department of the Interior – Explanations of Unavailable GHG Emissions Reduction Estimates

In this biennial reporting cycle, DOI is adding quantitative emissions estimates for two programs (Offshore Renewable Energy and the Orphaned Wells Program). DOI also has programs and policies that are not yet ready to provide estimates of emissions reductions. DOI programs that reduce fugitive emissions are focused on detecting and remediating fugitive emissions sources, however the technology used to detect these emissions cannot currently be used to provide quantitative emissions estimates. DOI carbon sequestration policies and regulations are under development and therefore do not yet have emissions reduction estimates. DOI abandoned mine land reclamation work also does not yet have an approved methodology for estimating emissions reductions. DOI is working with the interagency community to advance measurement and modeling to support quantitative emissions estimates under the National Strategy to Advance an Integrated U.S. Greenhouse Gas Measurement, Monitoring, and Information System.

Light-duty and Medium-duty Vehicle GHG Standards

Sector(s) Affected: Transport

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
217,000 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
600,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2012 (vehicle model year). Beginning in model year 2012, EPA has promulgated standards under the Clean Air Act requiring manufacturers producing passenger cars and light trucks for sale in the United States to meet GHG emissions standards, which increase in stringency, generally year over year. EPA established the first round of standards in 2010 for model years (MYs) 2012-2016; in 2012 EPA established standards for MYs 2017-2025. EPA took action in 2020 to reduce the stringency of standards for MYs 2021-2026, and in 2021 EPA again revised the standards for MYs 2023-2026 to increase stringency, essentially restoring the standards to levels similar to those established under the 2012 rule, with a slight increase in stringency for MY 2026. In March 2024, EPA established the most protective GHG standards yet for both light-duty vehicles and medium-duty vehicles for MYs 2027-2032.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2011

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, N_2O, HFCs (from vehicular air conditioners)

For non-CO_2 gases, what GWP values were used?

The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide, and multiple GWPs for HFCs (see Annex 6, Table A-233 of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*).

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

For the effects of light-duty vehicle standards during the reported calendar years, the EPA used the Optimization Model for reducing Emissions of Greenhouse gases from Automobiles (OMEGA) model and industry supplied GHG compliance data (direct emissions) to estimate the extent to which GHG emission standards reduce CO_2, N_2O and CH_4 emissions, and HFC emissions from vehicular air conditioners. OMEGA also estimates upstream emission impacts for the power sector using emission rate estimates generated by EPA's Integrated Planning Model (IPM) and the DOE NEMS and for the petroleum refining industry using EPA's Emissions Modeling Platforms.

Federal data sources supporting the EPA light-duty GHG emissions standards can be found in the Regulatory Impact Analysis supporting the MY 2012-2016, 2017-2025 and 2023-2026 rules, and MY 2027-2032 rules, available at:

- Regulatory Impact Analysis: Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (EPA-420-R-10-009, April 2010)[56]
- Regulatory Impact Analysis: Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (EPA-420-R-12-016, August 2012)[57]
- Regulatory Impact Analysis: Revised 2023 and Later Model Year Light Duty Vehicle GHG Emissions Standards (EPA-420-R-21-028, December 2021)[58]
- Regulatory Impact Analysis: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Regulatory Impact Analysis (EPA-420-R-24-004, March 2024).[59]

Federal estimates using the EPA OMEGA models, with inputs supporting the rulemaking, are available online.[60]

What approaches are used to ensure data quality, if any?

EPA's OMEGA model has undergone two rounds of peer review and the modeling approach, inputs, and assumptions were open to public notice and comment through each of the EPA rulemaking processes.[61]

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
The methodology accounts for the potential that the standards could lead to increased highway travel (i.e., through the "rebound" effect), as well as for potential increases and decreases in energy use and GHG emissions from various "upstream" processes (e.g., petroleum refining, electricity generation). The methodology accounts for projected changes in the upstream emissions from electricity generation due to changes in the electric grid mix. The projected impacts of the MY 2027-2032 rule, in particular, include the effects of the IRA on the emissions from electricity generated to meet the demand for light- and medium-duty vehicles. The methodology does not account for the lifecycle effects of the different technologies that manufacturers use to comply with the standards (in part due to the difficulty of determining with certainty what technologies manufacturers will choose to meet the standards because the standards are performance-based rather than design mandates). It should be noted that the estimates are based on assumptions about the mix of passenger cars and light trucks in the vehicle fleet, and actual emission reductions will vary based on the actual vehicles sold. The methodology uses projected emission reductions generated via modeling in support of the respective rulemaking analyses and does not reflect retrospective measurement of actual emission reductions.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Revisions were made to the methodology so that the estimates provided are consistent with the 2030 GHG reduction estimates projected in EPA's 2010 rulemaking that set standards for MY 2012-2016 vehicles (see 75 FR 25489, May 7, 2010, Table III.F.1-1), EPA's 2012 rulemaking that set standards for MY 2017-2025 vehicles (see 77 FR 62892, October 15, 2012, Table III-62) and the 2024 rulemaking that set standards for MY 2027-2032 (see 89 FR 28097, April 18, 2024, Table 204). Note that medium-duty vehicles were included along with light-duty vehicles for the 2024 rule, but prior to that had been included with the heavy-duty vehicle rules. Therefore, only a portion of the projected GHG reductions for 2030 reflect medium-duty vehicles, and

additional medium-duty vehicle GHG reductions are included with the heavy-duty vehicle estimates.

These methodological changes resulted in an increase in estimated GHG emission reductions (the estimates of projected GHG emission reductions are increased compared to prior estimates).

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

Yes. It should be noted that the Department of Transportation (DOT) recently established corporate average fuel economy (CAFE) standards and fuel efficiency programs for the light-duty and medium-duty vehicles sectors for MY 2027 and later. EPA's estimates capture the full effect of both programs, so to avoid the potential for double counting, this report does not include a separate DOT estimate for its standards.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Heavy-duty Vehicle GHG Standards

Sector(s) Affected: Transport

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
45,200 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
171,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2014 (model year). In 2011, EPA promulgated the first set of GHG emissions standards, which began in MY 2014 for medium- and heavy-duty highway vehicles. At the same time, the DOT established fuel efficiency standards, which were voluntary beginning in MY 2014 and mandatory beginning in MY 2016.

In 2016, EPA and DOT established a second phase (Phase 2) of the GHG gas emission and fuel efficiency standards for medium and heavy-duty highway vehicles for MYs 2021 through 2027. The rules included GHG emission and efficiency standards for semi-trailers beginning in MY 2018, but those standards were stayed by a D.C. Circuit Court decision on November 12, 2021.

In 2024, EPA promulgated a third phase (Phase 3) of GHG emission standards for heavy-duty highway vehicles for MYs 2027 through 2032.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2013

Emissions Estimation Approach

Which gases are measured?
CO_2, CH_4, N_2O, HFCs (from vehicular air conditioners)

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane, 265 for nitrous oxide, and multiple GWPs for HFCs (see Annex 6, Table A-233 of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*).

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
For the effects of medium- and heavy-duty vehicle standards for model years 2014 and beyond during the reported calendar years, the EPA Motor Vehicle Emission Simulator (MOVES) was used to estimate the extent to which combined fuel economy and GHG emission standards reduce CO_2, N_2O and CH_4 emissions, and HFC emissions from vehicular air conditioners.[62]

What approaches are used to ensure data quality, if any?
The underlying data and algorithms in EPA's MOVES model have undergone formal peer review, following EPA's peer review policies and procedures.[63] In addition, the MOVES Review Work Group under the Mobile Sources Technical Review Subcommittee (MSTRS) provided input throughout model development and reviewed major model updates.[64]

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
The methodology accounts for the potential that the standards could lead to increased highway travel (i.e., through the "rebound" effect), as well as for potential increases and decreases in energy use and GHG emissions from various "upstream" processes (e.g., petroleum refining, electricity generation). The methodology does not account for the lifecycle effects of the different technologies that manufacturers use to comply with the standards (in part due to the difficulty of determining with certainty what technologies manufacturers will choose to meet the standards because the standards are performance-based rather than design mandates).

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Emission reduction estimates in 2030 were revised so that the estimates are consistent with EPA GHG emissions standards for Phase 1 and Phase 2 and revised to include Phase 3. These

changes in methodology resulted in an increase in estimated GHG emission reductions for 2030.

The emission reductions for 2022 reflect the levels estimated for the GHG emissions standards for Phase 1 in 2020 and Phase 2 in 2021. This is likely a conservative estimate of GHG emission reductions for 2022.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

Yes. The methodology used avoids potential double counting of the DOT CAFE standards and fuel efficiency programs and the EPA GHG emissions standards. The method avoids double counting by using EPA's estimates of the future impacts of the medium- and heavy-duty vehicle standards for model years 2014 and beyond, which includes and accounts for estimates of the impact of DOT's standards.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

SmartWay Transport Partnership

Sector(s) Affected: Transport

Implementing Entity: Environmental Protection Agency

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
9,200 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
12,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

<u>**Timeframe**</u>

In what year did the program start?
2004

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Partners report fuel use and activity into reporting tools which calculate tons of CO_2 emitted. Partners self-report using EPA-developed reporting tools.[65]

What approaches are used to ensure data quality, if any?
The SmartWay partnership uses a four-pronged approach to provide data quality:

- Designing its data collection tools to be easily understandable by the partners filling them out, with a large number of automated quality checks
- Design of its database for optimal Partner Account Manager review and another set of automated quality checks
- Stringent manual review of partner data by its Partner Account Managers (PAMs)
- Rigorous data quality review, an audit system, and an adaptive feedback and design loop post Partner Account Manager review

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Most; the impacts do not reflect actions taken by shippers to reduce weight or miles.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes, although avoiding double counting of these impacts is addressed, as described here. SmartWay provided a technical basis for the heavy-duty vehicle (HDV) GHG regulation for MY 2014 and newer heavy-duty trucks. Because the rule applies to new engines and vehicles only, SmartWay will continue to generate CO_2 reductions from the legacy fleet, carrier operational strategies, and from vehicles and equipment not covered by the rule. The methodology compares SmartWay emissions to a modeled baseline from the EPA MOVES model, which includes the effects of the HDV GHG regulation for MY 2014 and newer heavy-duty trucks.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Methane Emissions Reduction Program State Grants

Sector(s) Affected: Energy: Supply

Implementing Entity: Environmental Protection Agency, Department of Energy, National Energy Technology Lab

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
780 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2024

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The emission reduction estimate uses an estimate provided by the 14 state grantees of how many wells they will plug by the end of the grant period (4,590 wells). (State grantees include

Texas, Pennsylvania, West Virginia, California, Ohio, Illinois, Louisiana, New Mexico, Kentucky, Colorado, New York, Michigan, Utah, and Virginia.) A methane emission rate of 0.7 kg CH_4/hr/well is used, based on a 2022 study of low-production oil and gas well sites and calculated by dividing the study's annual methane estimate from all active onshore low-production well sites by the number of low-production onshore wells.[66] The estimate uses an assumption of a constant emission rate of CH_4/hr. The hourly rate is then multiplied out to an annual value.

During the grant period, quarterly progress will be self-reported by state grantees.

What approaches are used to ensure data quality, if any?
State grantees are required to measure CH_4 emissions before and after a well has been plugged, in alignment with Department of Energy (DOE) methane measurement guidelines.[67]

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
These estimates reflect activities of 14 state grantees receiving $350 million in support from the Methane Emissions Reduction Program, but not the full set of activities that will be supported by the remainder of the $1.36 billion program, which includes multiple funding opportunities.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
N/A

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Federal Air Standards for Oil and Natural Gas Sector

Sector(s) Affected: Energy: Supply

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
191,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2012. On April 17, 2012, the EPA issued New Source Performance Standards (NSPS) under the Clean Air Act to reduce emissions of volatile organic compounds (VOC) from the oil and natural gas industry. On May 12, 2016, the EPA issued an update to the NSPS to further reduce emissions of VOC and methane. On December 2, 2023, the EPA issued an update to the NSPS to further reduce emissions of VOC and methane from new sources and issued Emissions Guidelines (EG) to reduce emissions of methane from existing sources (note: the rulemaking was published in March 2024).

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CH_4. The NSPS and EG reduce emissions of methane, VOC, and hazardous air pollutants.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

Projected emission reductions due to the NSPS/EG were estimated by applying reduction percentages to projections of applicable sources for the 2023 rulemaking. Reduction percentages are described within the background technical support document for the rule and the projections of sources are described in the regulatory impact analysis (RIA). These sources include pneumatic devices (pumps and controllers), fugitive emissions, storage vessels, associated gas, liquids unloading, reciprocating compressors, and centrifugal compressors.

Note, the estimates reported for the BTR (191,000 kt CO_2-eq. in 2030) are higher than the corresponding estimates from the 2023 NSPS/EG RIA (130,000 kt CO_2-eq. in 2030) because the analysis was adjusted to capture the impacts of the 2012 and 2016 NSPS rulemakings, whereas they were considered part of the baseline for the RIA.

Emissions reductions are based on analysis reported in the 2023 NSPS/EG RIA. In the RIA, potential emissions for each source were estimated using information from the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2019* (published in April 2021), Enverus (a private-sector energy analytics company) data accessed in 2021, Homeland Infrastructure Foundation-Level Data accessed in 2022, projections of new well drilling from the Energy Information Administration's 2022 Annual Energy Outlook, data from EPA's 2016 Oil and Gas Information Collection Request, and survey data submitted by the American Petroleum Institute in 2018.

What approaches are used to ensure data quality, if any?

EPA relied on the above published reference documents that were subject to rigorous public review.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?

Most. Some elements of the prior NSPS were omitted from the latest analysis as they would have contributed a relatively small percentage of the overall estimated emissions reductions (e.g., well completions). In addition, some elements of the most recent rulemaking were omitted from the quantitative assessment in the RIA as the available data was insufficient to produce a credible estimate of their impacts.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

The estimates presented attribute emission reductions from sources subject to the requirements of the NSPS and EG to the rule, although some of these actions may have taken place voluntarily in the absence of the requirement as oil and natural gas producers improved the environmental and economic efficiency of their activities.

Additional Context

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
Yes. The updates to policy, data, and methodology are wholesale. Most of the emissions sources regulated in the latest rulemaking action were not part of the prior rulemakings that formed the basis for the previous set of estimates.

These updates resulted in an increase in the GHG emission reduction estimate.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes, the Natural Gas STAR Program. Avoiding double counting of these impacts is addressed in the GHG emission reduction estimates for the Natural Gas STAR Partnership, as described here and in the corresponding methodology summary for Natural Gas STAR. At the time Natural Gas STAR Partnership reporting was active, the Partnership was the only federal voluntary program that tracked GHG emission reductions from the oil and gas industry. To avoid potential double counting, EPA's methods for calculating annual achievements for the Natural Gas STAR Program accounted for the impacts due to regulatory efforts (Clean Air Act New Source Performance Standards for the Oil and Natural Gas Sector).

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Carbon Pollution Standards for Fossil Fuel-fired Power Plants

Sector(s) Affected: Energy: Supply

Implementing Entity: Environmental Protection Agency

__Achieved and/or Expected Reductions__

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
50,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

__Timeframe__

In what year did the program start?
2024

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
Emission reduction estimates are calculated against a projected future base case scenario, for particular years, where the regulatory requirements of the rules are not in place.

__Emissions Estimation Approach__

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Modeled. Detailed power system modeling was conducted using the IPM, which reflects the electric power sector and all relevant inputs, factors, and parameters that influence the estimates of emissions across electric generating units. The modeling included a representation of over 55,000 units, existing inter-regional transmission constraints, fuel supply

and prices (coal and natural gas), and all relevant regulatory and legal constraints and requirements that govern the electric power system and reflects least-cost electric system dispatch across the entire contiguous U.S.

What approaches are used to ensure data quality, if any?
All power sector modeling data used in the rule underwent public review and comment, in addition to routine updates that occur periodically and as needed.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The values presented here are EPA's best estimate of the GHG emission reductions associated with this rulemaking. This analysis does not account for upstream emissions changes.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
The methodology captures the direct effects of the policies and does not capture indirect impacts outside of the primary sector.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
N/A

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The methodology includes all EPA regulations that affect these sources that were finalized at the time of the analysis, and therefore avoids double counting. To the extent that additional policies affecting these units were proposed or finalized after the analysis was completed, the estimate would not account for their impacts.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

EPA Green Power Partnership

Sector(s) Affected: Energy: Supply

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
57,128 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
68,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Yes; see description of emissions estimation approach below.

Timeframe

In what year did the program start?
2001

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA calculates indirect greenhouse gas impacts by applying a national, marginal CO_2 emission factor to total annual green power purchases (kWh) reported by program partners. Partners' annual purchases reflect eligible green power generated during the reporting period.

Estimated emission reductions for 2030 were estimated by applying adjusted growth rates to program outcomes based on an informed examination of the opportunity for reductions from green power.

The Green Power Partnership (GPP) relies on self-reporting by GPP partners of green power use and uses EPA's most recent version of AVERT for emission factors.

What approaches are used to ensure data quality, if any?
EPA receives annual reports from GPP partners, verifying annual green power purchases and/or onsite generation. Internally, EPA and its consultant verify data entry into its customer relationship management database, which includes dashboards to review data quality.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
GPP's actions to encourage voluntary purchases of green power are unique compared to other federal policies which may be used to fund or otherwise encourage the construction of new green power projects. For example, the Onshore Renewable Energy Development Program projects are often financed by long-term offtake agreements from the various state-based renewable energy compliance markets in the U.S. rather than the voluntary markets.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Natural Gas STAR & Methane Challenge

Sector(s) Affected: Energy: Supply

Implementing Entity: Environmental Protection Agency

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
4,780 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
N/A. No GHG emission reduction estimates are reported for 2030 due to the ending of the partnership programs.

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

<u>**Timeframe**</u>

In what year did the program start?
1993

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The EPA's Natural Gas STAR Program started in 1993 with the objective of achieving methane emission reductions through implementation of cost-effective best practices and technologies. Through the Program, Partner companies documented their voluntary emission reduction

activities and had the opportunity to report their accomplishments to the EPA annually. Over the course of the Natural Gas STAR Partnership from 1993 to 2022, EPA collaborated with over 100 companies across the natural gas value chain. Through the Partnership, EPA tracked more than 150 different methane-reducing activities and technologies and shared this information among Partners and through the Program website. Through 2020, Partner companies reported cumulative methane emissions reductions of nearly 1.7 trillion cubic feet since 1993.

The EPA's Methane Challenge Program was launched in 2016 to expand upon the Natural Gas STAR Program by providing Partner companies the opportunity to make ambitious, quantifiable emissions reductions commitments, to provide detailed, transparent reporting, and to receive Partner recognition. The EPA emphasized the importance of transparency by publishing these facility-level data. Since its inception, the Methane Challenge Program has included nearly 70 companies, primarily from the transmission and distribution segments.

Annually, Methane Challenge Partners submitted facility-level reports to EPA that characterized methane emission sources at their facilities and detail voluntary actions taken to reduce methane emissions. The reporting protocol for the MC Partnership was more rigorous and detailed. Partner companies were required to use the calculation methodologies provided in the Program's "Methane Challenge Technical Documents"; these methodologies are consistent with those used for reporting to U.S. EPA's Greenhouse Gas Reporting Program (GHGRP). If a GHGRP method was not available for an emission source, Partner companies used emission factors developed for the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*.

In 2022, EPA sunset the NGS Partnership, ending the NGS Partnership agreements and annual reporting elements of the program, while retaining a focus on technology transfer and stakeholder engagement. In 2024, EPA will sunset the MC Partnership, following publication of the sixth and final Methane Challenge Report for Calendar Year 2022 data (Reporting Season 2023). Due to the ending of the partnership elements of these programs, there are no projected emission reductions in 2030. EPA, through the Natural Gas STAR Program, will continue providing a framework for technical support, stakeholder engagement, and sharing information about opportunities for reducing methane emissions from the oil and gas industry.

The data source used for GHG emission reduction estimates were Program Partner company submitted annual reports.

What approaches are used to ensure data quality, if any?

For the NGS Partnership, each annual report was reviewed using several basic checks to assess whether reductions data appeared reasonable (given previously reported data trends and that the reductions were not the result of regulatory requirements).

For the MC Partnership, each annual report was reviewed using dozens of detailed data checks to assess whether emission reduction values were estimated correctly and confirm that actions were non-regulatory in nature.

For both Partnerships, any inconsistencies were resolved through direct correspondence with the appropriate Partner company. As appropriate, these data were omitted or adjusted prior to their inclusion in the Natural Gas STAR Program annual totals.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All. The impacts reflect all of the activities reported to the Natural Gas STAR Program by Partner companies.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes, although avoiding double counting of these impacts is addressed, as described here. At the time Partnership reporting was active, Natural Gas STAR was the only federal voluntary program that tracked GHG emission reductions from the oil and gas industry. To avoid potential double counting, EPA's methods for calculating annual achievements accounted for the impacts due to regulatory efforts (Clean Air Act New Source Performance Standards for the Oil and Natural Gas Sector).

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Coalbed Methane Outreach Program

Sector(s) Affected: Energy: Supply

Implementing Entity: Environmental Protection Agency

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
10,970 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
5,780 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Yes; see description of emissions estimation approach below.

<u>**Timeframe**</u>

In what year did the program start?
1994

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CH_4 (methane)

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The Coalbed Methane Outreach Program (CMOP) annually measures accomplishments using a metric of emissions reductions achieved from coal mine methane recovery projects in the U.S. The Program uses a tiered system applied to total emission reductions from active underground

and abandoned mines. Weightings of 90 percent, 70 percent, and 40 percent are applied to each project's reductions, depending on CMOP's level of involvement.

For 2030 impacts, EPA used the methodology from EPA's Global Non-CO_2 Greenhouse Gas Emissions Projections & Marginal Abatement Cost Analysis,[68] to evaluate mitigation potential in the \$0-\$5/tCO_2 eq range, and adjusted to give CMOP credit for approximately 40 percent of those projected reductions.

Data sources include federal data from the Energy Information Administration and the Department of Labor Mine Safety and Health Administration (MSHA); voluntary GHG/carbon registries; industry data through public annual reports; and data reported directly to the U.S. GHGRP; and federal estimates using technical expert judgment.

What approaches are used to ensure data quality, if any?
Data are reviewed, analyzed, and compared with previous year(s) and across various sources.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All; the measured GHG impacts reflect all of the actions of the program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
No. The CMOP is the only federal voluntary program that tracks GHG emission reductions from the coal mining industry. There are no federal regulations requiring emissions reductions and no opportunity for double counting.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

ENERGY STAR Products

Sector(s) Affected: Energy: Residential and Commercial End-Use

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
194,213 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
266,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1992

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA calculates ENERGY STAR's emission reductions by applying pollutant emission factors to net annual electricity and fossil fuel savings attributable to the program. For electricity, EPA uses national marginal pollutant emission factors to estimate reduced emissions from power plants that run less due to reduced demand. These factors are derived using EPA's AVERT. Emission

factors applied to direct fossil fuel savings are derived from on-site fuel combustion emissions using EPA's GHG Emission Factors Hub.

Sales of products attributed to the ENERGY STAR program are based on shipments of products to the U.S. and are defined as those that are above and beyond efficient product purchases that would have occurred without ENERGY STAR actions. These sales are estimated by:

- Collecting annual shipment data on ENERGY STAR certified products from participating product manufacturers, provided to EPA as a condition of partnership, and comparing these data to industry reports on total annual product shipments. EPA screens for data quality to ensure an accurate reflection of ENERGY STAR sales.
- Establishing reference case baselines for annual product sales for each product category without ENERGY STAR, based on percent of models that meet the ENERGY STAR requirements when they are initially set, as well as an analysis of the market barriers for each product related to the benefit/cost ratio.
- ENERGY STAR products with a lower benefit/cost ratio face higher market barriers, and it is assumed those products are more likely to be purchased due to the ENERGY STAR label and less likely to be prevalent in a reference case baseline than products with a higher benefit/cost ratio.

Annual energy savings are calculated using standardized values for the difference in annual energy use between a product that meets the ENERGY STAR requirements and a product that is not ENERGY STAR certified. For these values, EPA:

- Assumes that ENERGY STAR certified products just meet the ENERGY STAR minimum savings thresholds, even though there are some products that exceed those levels.
- Assumes non-ENERGY STAR products meets minimum efficiency standards where standards exist. If standards do not exist, assumes the average energy use of available products within a category that do not meet the ENERGY STAR criteria prior to the introduction of an ENERGY STAR specification. EPA updates the baseline assumptions for products based on changes in ENERGY STAR requirements, as well as federal standards.
- Uses primary data from third parties, such as product metering on power use information, where additional information is necessary to estimate energy savings.
- Uses product-specific lifetimes that vary from 4 to 25 years.
- Subtracts the savings associated with products used in ENERGY STAR Certified New Homes to avoid double counting savings.

- Accounts for interactive effects from HVAC products and windows by assuming that consumers would apply the most cost-effective measure first. For example, ENERGY STAR attributed savings from windows decrease when they are applied to homes that have already installed efficient HVAC equipment.

Program-wide energy savings were last calculated for 2020. Energy savings goals for 2022 and 2030 were estimated by applying adjusted growth rates to program savings based on an informed examination of the opportunity for reductions from new products.

More information on ENERGY STAR'S program impacts and methodologies is available online.[69]

Product sales data is provided by manufacturer partners as a condition of the partnership, as well as gathered from industry reports.

What approaches are used to ensure data quality, if any?
EPA screens the shipment data provided by partners and resolves any issues. EPA also takes steps to reconcile any discrepancies between annual product sales data and product stock accounting. Where additional information is necessary to estimate energy savings, EPA supports primary data collection, such as product metering to collect power use information.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes. The methodology avoids potential double counting of emissions reductions from Lighting

Energy Efficiency Standards, Appliance and Equipment Efficiency Standards, and ENERGY STAR Certified New Homes.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

ENERGY STAR Commercial Buildings

Sector(s) Affected: Energy: Commercial End-Use

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
133,000 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
141,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1993

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA calculates ENERGY STAR's emission reductions by applying pollutant emission factors to net annual electricity and fossil fuel savings attributable to the program. For electricity, EPA uses national marginal pollutant emission factors to estimate reduced emissions from power plants that run less due to reduced demand. These factors are derived using EPA's AVERT. Emission

factors applied to direct fossil fuel savings are derived from on-site fuel combustion emissions using EPA's GHG Emission Factors Hub.

EPA develops commercial buildings impact evaluations using econometric modeling. The research design is outlined in a series of peer-reviewed articles. Generally, the methodology attributes certain aggregate national energy savings in the commercial sector to the ENERGY STAR program, controlling for the impact of other federal and non-federal energy efficiency programs.

To calculate the national impacts of ENERGY STAR for commercial buildings, EPA uses historical energy consumption data for relevant fuel types from the U.S. Energy Information Administration, and other publicly available data, to estimate the differential effects of voluntary energy efficiency programs on electricity and natural gas consumption. A quasi-experimental research design is formed by designating state treatment and control groups and then using the control group energy consumption behavior to simulate counterfactual energy consumption for the treatment group. Being comprehensive in scope, the impact estimates incorporate other notable secondary effects, including spillover and market transformation savings.

Program-wide energy savings were last calculated for 2020. Energy savings goals for 2022 and 2030 were estimated by applying adjusted growth rates to program savings based on an informed examination of the opportunity for reductions from commercial buildings.

More information on ENERGY STAR'S program impacts and methodologies is available online.[70] Federal data used is from the Energy Information Administration and Department of Energy programs. Industry reports referenced for energy efficiency program information include Consortium for Energy Efficiency, American Council for an Energy-Efficient Economy, and electricity and natural gas utilities.

What approaches are used to ensure data quality, if any?
The soundness of the data used for energy consumption modeling is ensured through the peer-review process prior to journal publication. The data and calculations employed in the post-model estimation analyses are thoroughly reviewed by EPA staff and outside consultants.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?

The spillover and market transformation effects of the program are captured in this methodology.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?

No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

The methodology avoids potential double counting of energy savings reported from ENERGY STAR Labeled Products, Lighting Energy Efficiency Standards, Appliance and Equipment Efficiency Standards, Building Energy Codes, Federal Energy Management Programs, State Energy Program, Energy Efficiency and Conservation Block Grants, and other publicly funded commercial building energy efficiency programs, including state and local programs.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

ENERGY STAR Residential New Construction

Sector(s) Affected: Energy: Residential End-Use

Implementing Entity: Environmental Protection Agency

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
4,284 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
6,700 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Yes. These differences are addressed in the description of the emissions estimation approach below.

<u>**Timeframe**</u>

In what year did the program start?
1995

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA calculates ENERGY STAR's emission reductions by applying pollutant emission factors to net annual electricity and fossil fuel savings attributable to the program. For electricity, EPA uses national marginal pollutant emission factors to estimate reduced emissions from power plants that run less due to reduced demand. These factors are derived using EPA's AVERT. Emission

factors applied to direct fossil fuel savings are derived from on-site fuel combustion emissions using EPA's GHG Emission Factors Hub.

To account for the energy savings resulting from the operation of ENERGY STAR certified homes across a range of climates, sizes, and fuel types, EPA estimates a composite energy consumption of a standard (i.e., code-minimum) home constructed in each of seven climate zones, taking into account regional construction characteristics (e.g., foundation type, typical fuel use profile) and configuring the home to the applicable model energy code. EPA then applies ENERGY STAR requirements to each modeled home to determine an estimated composite energy consumption of ENERGY STAR homes in each climate zone. These calculated energy consumptions are used to calculate savings.

Energy savings goals for 2030 were estimated by applying adjusted growth rates to program savings based on an informed examination of the opportunity for reductions from new homes.

More information on ENERGY STAR'S program impacts and methodologies is available online.[71]

On a quarterly basis, independent oversight organizations called Home Certification Organizations (HCO) submit data to EPA on the number of homes that have been certified to meet ENERGY STAR program requirements. This reporting is a condition of approval to be an HCO for ENERGY STAR.

What approaches are used to ensure data quality, if any?
Performance is independently verified through modeling, on-site testing and inspections by certified third parties. HCOs must abide by a set of quality assurance practices to ensure data quality. In addition, EPA reviews the submitted data and resolves any data irregularities.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

Yes. The methodology avoids potential double counting of emissions reductions from Building Energy Codes. ENERGY STAR Labeled Products adjusts its emissions savings to avoid double counting due to ENERGY STAR products installed in ENERGY STAR certified homes.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

ENERGY STAR for Industry

Sector(s) Affected: Energy: Industrial End-Use

Implementing Entity: Environmental Protection Agency

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
36,760 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
43,000 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

<u>**Timeframe**</u>

In what year did the program start?
2001

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
CO_2

For non-CO_2 gases, what GWP values were used?
N/A

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA calculates ENERGY STAR's emission reductions by applying pollutant emission factors to net annual electricity and fossil fuel savings attributable to the program. For electricity, EPA uses national marginal pollutant emission factors to estimate reduced emissions from power plants that run less due to reduced demand. These factors are derived using EPA's AVERT. Emission

factors applied to direct fossil fuel savings are derived from on-site fuel combustion emissions using EPA's GHG Emission Factors Hub.

EPA develops industrial plants impact evaluations using econometric modeling. The research design is outlined in a series of peer-reviewed articles. Generally, the methodology attributes certain aggregate national energy savings in the industrial sector to the ENERGY STAR program, controlling for the impact of other federal and non-federal energy efficiency programs.

To calculate the national impacts of ENERGY STAR for industrial plants, EPA uses historical energy consumption data for relevant fuel types from the U.S. Energy Information Administration, and other publicly available data, to estimate the differential effects of voluntary energy efficiency programs on electricity, natural gas, and other fuels consumption. A quasi-experimental research design is formed by designating state treatment and control groups and then using the control group energy consumption behavior to simulate counterfactual energy consumption for the treatment group. Being comprehensive in scope, the impact estimates incorporate other notable secondary effects, including spillover and market transformation savings.

Program-wide energy savings were last calculated for 2020. Energy savings goals for 2022 and 2030 were estimated by applying adjusted growth rates to program savings based on an informed examination of the opportunity for reductions from industrial plants.

More information on ENERGY STAR'S program impacts and methodologies is available online.[72]

Various federal data sources are used, including the Energy Information Administration and Department of Commerce's Annual Survey of Manufactures.

What approaches are used to ensure data quality, if any?
The soundness of the data used for energy consumption modeling is ensured through the peer-review process prior to journal publication. The data and calculations employed in the post-model estimation analyses are thoroughly reviewed by EPA staff and outside consultants.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
The spillover and market transformation effects of the program are captured in this methodology.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
The methodology avoids potential double counting of energy savings reported by U.S. DOE industrial programs, as well as savings from state and local energy efficiency programs.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

American Innovation and Manufacturing Act (AIM Act)

Sector(s) Affected: Industrial Processes and Product Use

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
29,886 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
146,096 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2022

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2021

Emissions Estimation Approach

Which gases are measured?
HFCs. Eighteen HFCs listed in the AIM Act (e.g., HFC-125, HFC-134a, HFC-23) and their isomers.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: multiple GWPs for HFCs (see Annex 6, Table A-233 of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*).

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA's Vintage Model (described in the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*) is used. Emission reductions are based on the modeled pathway towards compliance with HFC consumption phasedown steps in 2022, 2024, 2029, 2034 and 2036, the restrictions set by the

2023 Technology Transition Rule, and the HFC Management requirements. Resulting emission reductions are calculated through 2050 to account for the lag time between chemical consumption and emissions.

Data and assumptions are obtained from published sources, including federal and industry reporting, as well as confidential business information.

What approaches are used to ensure data quality, if any?
The EPA Vintage Model used was peer-reviewed in 2017. As part of the annual review of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, the inputs and assumptions of the model are first reviewed by industry and government experts before being opened for public comment, and then submitted to the UNFCCC, where it undergoes additional review. A regulatory impact analysis and addenda were provided as part of the notice-and-comment rulemakings which included information on the data used.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The measured impacts reflect some to most, but not all, of the actions that are to be undertaken under the authority of the AIM Act. At this time, we cannot determine to what extent other actions will result in additional emission reductions.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes. The EPA National Program for Heavy-Duty Vehicle GHG Emission Standards and the EPA Light-Duty and Medium-Duty Vehicle GHG Standards account for HFC emission reductions from vehicular air conditioning. The modeling performed for the AIM Act does not include such emission reductions in the calculations presented.

The Significant New Alternatives Policy (SNAP) program lists HFCs as acceptable, acceptable with restrictions, or unacceptable in specific end-use subsectors, resulting in emission reductions. To avoid double-counting, the version of the model used to simulate compliance with the AIM Act is used as the version of the model to calculate emission reductions under SNAP. Additional reductions from the HFC-using sectors beyond those projected for SNAP using that model are attributed to the AIM Act.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Significant New Alternatives Policy Program

Sector(s) Affected: Industrial Processes and Product Use

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
383,272 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
480,020 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1990 (the year when authorizing legislation was passed in the 1990 Clean Air Act Amendments). Initial rulemaking to implement the SNAP Program was finalized in 1994. However, industry took pre-compliance actions in response to the prior changes to authorizing legislation that led to changes in the use of Ozone-Depleting Substances (ODS) and the uptake in the use of HFCs. This "pre-compliance" activity is accounted for in the methodology.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
1989

Emissions Estimation Approach

Which gases are measured?
HFCs, PFCs, SF_6, CO_2. Reductions in Ozone Depleting Substances (e.g., CFC-11, CFC-12, CFC-115, HCFC-22, HCFC-141b, HCFC-142b), fluorinated substitutes (e.g., HFC-32, HFC-125, HFC-134a, HFC-143a), and other substitutes (e.g., ammonia, carbon dioxide) are tracked by the program. Only HFCs, PFCs, SF_6, and CO_2 are included in the reported emission reduction estimate.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 23,500 for SF_6 and multiple GWPs for HFCs and PFCs (see Annex 6, Table A-233 of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*).

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
EPA's Vintage Model (described in the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*) is used. Consumption and emission of ODS substitutes are modeled by estimating the size of the markets, the uptake of non-ODS substitutes within each end-use, changes in technologies, and emission factors. To determine emission reductions, EPA compares two Vintage Model Scenarios:

- Estimates of emissions assuming all requirements under Title VI of the Clean Air Act.
- Estimates of emissions assuming the ODS phase out occurs in compliance with the Montreal Protocol on Substances that Deplete the Ozone Layer. This is developed as a business-as-usual scenario assuming that trends that were in place prior to establishment of SNAP continue.

Data and assumptions are obtained from published sources, including federal and industry reporting, as well as confidential business information.

What approaches are used to ensure data quality, if any?
The EPA Vintage Model was peer reviewed in 2017. As part of the annual review of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, the inputs and assumptions of the Vintage Model are first reviewed by industry and government experts and the public before being submitted to the UNFCCC, where it undergoes an additional review.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The GHGs reported in the emission reduction estimate only include HFCs, PFCs, CO_2 and SF_6. Reductions of other GHGs resulting from the program, specifically ODS, are not included in the estimate.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?

No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes. The EPA National Program for Heavy-Duty Vehicle GHG Emission Standards and the EPA Light-Duty and Medium-Duty Vehicle GHG Standards account for HFC emission reductions from vehicular air conditioning. The modeling performed for SNAP does not include such emission reductions in the calculations presented.

The AIM Act establishes a phasedown in the production and consumption of HFCs. To avoid double-counting, the version of the model used to simulate compliance with the AIM Act is also used as the version of the model to calculate emission reductions under SNAP. Additional reductions from the HFC-using sectors beyond those projected for SNAP using that model are attributed to the AIM Act.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

GreenChill Advanced Refrigeration Partnership

Sector(s) Affected: Industrial Processes and Product Use

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
11,557 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
18,403 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2007

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
2006

Emissions Estimation Approach

Which gases are measured?
HFCs. Reductions in ODS (e.g., CFC-12, HCFC-22) and HFCs (e.g., HFC-134a, HFC blends including R-404A and R-507A) are tracked by the partnership. The GHGs reported as part of the emission reduction estimate only include HFCs. Reductions of other GHGs, specifically ODS, are not included in the reported estimate.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: multiple GWPs for HFCs (see Annex 6, Table A-233 of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*).

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

Average partner emissions are compared to the national average for typical U.S. supermarket stores. Past emission reductions from the partnership are then taken as the difference of the typical U.S. store and the partnership average store, multiplied by the number of stores represented by the data provided by partners.

Annual partner reports are used to characterize partner stores. Characterization of typical U.S. supermarket stores is based on information from EPA's Vintage Model (described in the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*), partners, and other industry experts.

What approaches are used to ensure data quality, if any?
To ensure calculations are correct, each partner is given a report to double-check their individual corporate-wide emission rates and partnership averages are provided so that partners can assess the reasonableness of those averages, benchmark their own emission rates, and set goals to improve.

The EPA Vintage Model used was peer-reviewed in 2017. As part of the annual review of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, the inputs and assumptions of the model are first reviewed by industry and government experts before being opened for public comment, and then submitted to the UNFCCC, where it undergoes additional review.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The GHGs reported in the emission reduction estimates only include HFCs. Reductions of other GHGs, specifically ODS, are not included in the reported estimates. The reported GHG impacts included in the estimate reflect approximately 50 percent of the GHG reductions resulting from the program in the early years, rising to approximately 90 percent in 2020 (and eventually 100 percent once the ODS phaseout is complete and ODS stocks are depleted).

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double

counting?
No.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

Responsible Appliance Disposal Program

Sector(s) Affected: Industrial Processes and Product Use

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
46 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
128 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
2006

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
HFCs. Reductions in ODS (e.g., CFC-11, CFC-12, HCFC-22, HCFC-1241b) and HFCs (e.g., HFC-134a, HFC-245fa) are tracked by the program. The GHGs reported in the emission reduction estimate only include HFCs. Reductions of other GHGs as a result of the program, specifically ODS, are not included in the reported estimate.

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC Fifth Assessment Report (AR5) were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: multiple GWPs for HFCs (see Annex 6, Table A-233 of the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*).

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

Emission reductions are based on partner reports that detail the number of appliances and pounds of chemical reclaimed and destroyed. Results are adjusted to account for the recycling of durable components (metal, plastic, glass) that also occurs under the RAD program, using EPA's Waste Reduction Model.

The primary data source used is annual partner reports.

What approaches are used to ensure data quality, if any?
The reporting form features tabs for quality assurance, including typical reported average quantities across partners. Aggregated totals from all partners are published and provided so that partners can assess the reasonableness of those totals and benchmark their own data.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
The GHGs reported in the emission reduction estimate only include HFCs. Reductions of other GHGs, specifically ODS, are not included in the reported estimate. The reported GHG impacts reflect approximately 5-20 percent of the GHG reductions resulting from the program in the early years, rising to about 40 percent in 2020 and increasing thereafter.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
No.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

SF_6 Emission Reduction Partnership for Electric Power Systems

Sector(s) Affected: Industrial Processes and Product Use

Implementing Entity: Environmental Protection Agency

<u>**Achieved and/or Expected Reductions**</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
500 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
1,120 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
The 2022 emission reduction estimate is based on reported Partner SF_6 emissions, using a mass-balance method, as described below. The 2030 emission reduction estimate is based on a marginal abatement cost curve analysis to estimate program impacts.

<u>**Timeframe**</u>

In what year did the program start?
1999

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>**Emissions Estimation Approach**</u>

Which gases are measured?
SF_6

For non-CO_2 gases, what GWP values were used?
The 100-year GWP value from the IPCC AR5 was used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 23,500 for SF_6.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
Facility-specific mass-balance methodology. The mass-balance method works by tracking and systematically accounting for all company purchases and uses of SF_6 during the reporting year.

This method is provided by the 2006 IPCC Guidelines as the Tier 3 approach for estimating emissions from electrical transmission and distribution facilities. EPA calculates program achievements as the difference between estimated emissions for one year compared to the previous year. The program also tracks total emissions reduced since the Partnership began in 1999.

Partner data is reported either through the GHGRP (facilities above the mandatory reporting threshold) or voluntarily (facilities below the mandatory GHGRP reporting threshold). The GHGRP began collecting annual facility-level emissions data from this sector in 2012, from both partners and non-partners.

For 2030 impacts, EPA used the methodology from EPA's Global Non-CO_2 Greenhouse Gas Emissions Projections & Marginal Abatement Cost Analysis,[73] to evaluate mitigation potential in the \$0-\$5/tCO_2 eq range.

What approaches are used to ensure data quality, if any?
Data collected through the Greenhouse Gas Reporting Program is based on regulatory requirements in the Greenhouse Gas Reporting Rule (40 CFR Part 98). This regulation has specific Quality Assurance/Quality Control and data quality reporting requirements for the data submitted to EPA. The agency conducts a thorough verification process for all data received including automated data quality checks using a verification tool and analyses of data, and works directly with reporting facilities to address any issues that arise. Data collected through voluntary submission uses the same mass-balance methodology as the mandatory GHGRP and is reviewed with data quality checks and EPA works directly with voluntary reporting facilities to address any issues that arise.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All; the impacts reflect all of the activities achieved by Partner utilities of the SF_6 Emission Reduction Partnership for Electric Power Systems.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?

EPA calculates annual program accomplishments by subtracting current year emissions from previous year emissions. If the result is negative, the year's emissions reductions are counted as zero. This occurs when the absolute emissions from partners in the year have increased from the previous year, but the emission rate remains generally the same because nameplate capacity of SF_6 also increased.

EPA was previously summing all emission reductions since the Partnership began in 1999, which did not allow for accurate comparison. The new method results in decreased annual emission reduction estimates over the time series, with some years equaling zero when no reductions were achieved that year across the entire program (though the absolute emissions from all partners in the year have increased from the previous year, the emission rate remained the same or lower because the partners' total nameplate capacity of SF_6 also increased).

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?

There are no similar or related federal programs, policies, or measures.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

AgSTAR

Sector(s) Affected: Agriculture

Implementing Entity: Environmental Protection Agency

<u>Achieved and/or Expected Reductions</u>

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
3,790 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
12,060 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Yes; see description of emissions estimation approach below.

<u>Timeframe</u>

In what year did the program start?
1994

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

<u>Emissions Estimation Approach</u>

Which gases are measured?
CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
The AgSTAR Program calculates its annual emission reductions achieved based on 40 percent of the emissions reductions voluntarily reported to the Program by industry members on an annual basis. Industry members provide facility-level data and the corresponding emissions reductions are calculated using IPCC methodologies. These data are used to determine

Program emission reduction totals and measure the overall effectiveness of the AgSTAR Program.

For 2030 impacts, EPA used the methodology from EPA's Global Non-CO_2 Greenhouse Gas Emissions Projections & Marginal Abatement Cost Analysis,[74] to evaluate mitigation potential in the \$0-\$5/tCO_2 eq range.

Data sources include voluntary data submitted by industry members under information collection regulations, publicly available information via press releases, news articles and project developer websites.

What approaches are used to ensure data quality, if any?
Each submission is reviewed to ensure that the data are reasonable and does not conflict with other publicly reported data for that facility. Any inconsistencies are resolved through direct correspondence with the facility owner or operator. As appropriate, these data are omitted or adjusted prior to their inclusion in the AgSTAR Program annual totals.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Some. The impacts reflect the direct methane emissions reductions achieved by the AgSTAR Program.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
There is a small subset of projects funded by USDA policies and measures that are also accounted for by AgSTAR. The revised AgSTAR methodology to estimate annual achievements generally accounts for this and other market impacts by not crediting 100 percent of industry achievements. The projections methodology to estimate impacts in 2030 does account for USDA actions.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Standards for New Sources and Emission Guidelines for Existing Sources - Landfills

Sector(s) Affected: Waste

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
N/A

If available, what is the estimate of GHG emission reductions expected in the year 2030?
317,744 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
N/A

Timeframe

In what year did the program start?
1996. EPA promulgated NSPS/EG for municipal solid waste (MSW) landfills in 1996. In 2016, EPA announced final updates to its NSPS/EG that further reduced emissions of methane-rich landfill gas from new and existing MSW landfills. In 2021, EPA promulgated a federal plan to implement the 2016 EG for existing MSW landfills located in states and Indian country where state plans or tribal plans were not in effect.

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
The NSPS/EG requires landfills to install gas collection and control systems (GCCS) when the landfill exceeds the emission rate and design capacity cutoffs. Under the NSPS/EG, once a landfill exceeds the thresholds it has 30 months to install a GCCS. As a result, the reductions begin happening in various years depending on when each landfill is required to install controls. The earliest date reductions would have started occurring would have been 1999. Once a landfill is closed, it can remove a GCCS after (1) the landfill is closed, (2) the GCCS has operated for at least 15 years or the landfill owner or operator can demonstrate that the GCCS will be unable to operate for 15 years due to declining gas flows, and (3) the emission rate does not exceed the standard.

Emissions Estimation Approach

Which gases are measured?

CH_4. The NSPS/EG require collection and control of landfill gas (LFG) by routing it to a non-enclosed flare, an enclosed combustion device, or a treatment system that processes the collected gas for subsequent sale or beneficial use. LFG is comprised of approximately 50 percent methane, 50 percent carbon dioxide, and trace amount of nonmethane organic compounds (NMOC). Although the NSPS/EG measures NMOC as a surrogate for LFG, the destruction of NMOC also controls methane.

For non-CO_2 gases, what GWP values were used?

The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?

Modeled. Estimates of annual methane emissions were developed for each landfill in the database using a first-order decay equation to model the emissions from each landfill over time. Inputs to the model include landfill-specific waste data from the database and emission factors for NMOC. Methane reductions resulting from controls installed under NSPS/EG regulations were calculated by determining when the modeled NMOC emissions from each landfill exceeded the emission thresholds specified in the regulation. Currently, the regulations require landfills with design capacities of at least 2.5 million megagrams (Mg) and 2.5 million cubic meters in size with estimated NMOC emissions of at least 34 Mg per year to collect and control LFG. EPA estimated emission reductions in terms of the amount of methane combusted, which was calculated by multiplying the modeled LFG collected amount by a destruction efficiency of 98 percent.

EPA is unable to provide an estimate of achieved reductions in 2022 because the changes to the standards finalized in 2016 had not yet been fully implemented. In 2021, EPA promulgated a federal plan to implement the 2016 EG for existing MSW landfills located in states and Indian country where state plans or tribal plans were not in effect. Landfills needing to incrementally control emissions under the federal plan were required to comply with the standards after 2022, so the modeling this report relies upon (and performed in support of the 2016 rulemaking) would likely overstate emissions reductions in 2022; however, the 2030 estimated reductions remain EPA's best estimate of the impacts of the NSPS/EG regulations in 2030.

To estimate the methane reductions resulting from the NSPS/EG regulations, a landfill database was developed using mandated data submitted to EPA's GHGRP. This data was supplemented with voluntarily submitted data from a landfill and LFG energy project database maintained by EPA's Landfill Methane Outreach Program (LMOP). EPA also consulted with regional offices, states, and local authorities to identify new landfills anticipated to build or modify in future years. EPA also developed model landfills to fill gaps in the existing data.

What approaches are used to ensure data quality, if any?
The two data sources described above (using GHGRP and LMOP data, respectively) were compared with one another to assess which source to use and resolve inconsistencies in the dataset. Further, GHGRP data went through an internal data verification process prior to being used in this dataset. Several automated data checks were employed to ensure that various model inputs related to one another and that data gaps could be filled based on a practical set of assumptions.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
All. Estimated methane impacts include all aspects of the required NSPS/EG.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>Additional Context</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes, although double counting of these impacts is addressed, as described here. The LMOP also measures methane reductions from non-NSPS landfills (i.e., voluntary reductions). The method used by LMOP to estimate emission reductions from that program takes into account the NSPS/EG rule in order to avoid double counting of emission reduction estimates. However, because the NSPS/EG rule methodology estimates emissions reductions based on modeling, while LMOP estimates its emission reductions based on LMOP's understanding of whether the landfill is subject to the NSPS/EG, there is potentially a small amount of double counting occurring due to the different methods used. The NSPS/EG methodology does not adjust for this potential overlap.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?

N/A

Landfill Methane Outreach Program

Sector(s) Affected: Waste

Implementing Entity: Environmental Protection Agency

Achieved and/or Expected Reductions

If available, what is the estimate of GHG emission reductions achieved in the year 2022?
20,000 kt CO_2 eq

If available, what is the estimate of GHG emission reductions expected in the year 2030?
20,460 kt CO_2 eq

If both estimates are provided, are there any key differences to highlight between the methodologies and assumptions used to develop these estimates?
Yes; see description of emissions estimation approach below.

Timeframe

In what year did the program start?
1994

If emission reductions were estimated using a year other than the start year as the "zero" point for reductions, what was that year?
N/A

Emissions Estimation Approach

Which gases are measured?
CH_4

For non-CO_2 gases, what GWP values were used?
The 100-year GWP values from the IPCC AR5 were used, consistent with the 2024 U.S. national GHG inventory covering 1990-2022: 28 for methane.

How are GHG impacts estimated (e.g., direct measurements, emissions factor, modeling) and what are the primary data sources used (e.g., federal estimates, industry reports, self-reporting)?
LMOP calculates annual reductions from operational energy projects and flares at landfills for which the Program provides assistance, including technical information, and/or where there is Partner involvement in implementing the project; only including assistance for landfills not subject to regulations under the Clean Air Act, including NSPS and EGs. For operational LFG

energy projects, the LMOP database includes the estimated megawatt capacity of each electricity project and the estimated amount of LFG utilized by each direct-use project. These values are used in the calculations to determine annual emission reductions.

For 2030 impacts, EPA used the methodology from EPA's Global Non-CO_2 Greenhouse Gas Emissions Projections & Marginal Abatement Cost Analysis,[75] to evaluate mitigation potential in the \$0-\$5/tCO_2 eq range.

The data is updated annually based on information gathered from LMOP Partners, other stakeholders in the LFG industry, as well as information reported directly to EPA through the Greenhouse Gas Reporting Program (GHGRP). Landfills above the reporting threshold began reporting GHG emissions data to EPA through the GHGRP in 2011 for the calendar year 2010. LMOP collects data annually on LFG energy production from LMOP industry Partners through an information collection request.

What approaches are used to ensure data quality, if any?
LMOP verifies the energy production data after the collection process and resolves inconsistencies with the appropriate LMOP Partner company.

Do these quantified estimates of GHG emission reductions reflect all, most, or just some of the effects anticipated from this policy or measure?
Some. These measured GHG impacts reflect the direct methane emissions reductions achieved through LMOP.

Does the methodology used account for GHG impacts beyond the policy's direct effects or outside of the primary sector (such as broader market impact or lifecycle effects)?
No.

<u>**Additional Context**</u>

Are there any key changes from the methodology used to provide estimates in the U.S. Eighth National Communication and Fifth Biennial Report? If so, how do those changes affect the estimated values?
No change.

Are there other federal policies and measures that have attributed GHG impacts from similar or related actions? If applicable, does this program's methodology adjust for potential double counting?
Yes, although avoiding double counting of these impacts is addressed, as described here. LMOP is the only voluntary federal program that tracks GHG impacts from the landfill gas energy industry. Under the Clean Air Act, there are landfill regulations (NSPS and EG) that control GHG

emissions by limiting landfill gas emissions from landfills of a certain size and emissions threshold. EPA's method for calculating annual achievements and for projecting future impacts accounts for the impacts from regulations to avoid potential double counting. However, because the NSPS/EG rule methodology estimates emission reductions based on modeling, while LMOP estimates its emission reductions based on LMOP's understanding of whether the landfill is subject to the NSPS/EG, there is potentially a small amount of double counting occurring due to the different methods used.

Is there any other context to provide on methodologies and assumptions used or how to interpret the estimates?
N/A

U.S. Environmental Protection Agency – Explanations of Unavailable GHG Emissions Reduction Estimates

For EPA policies and measures without GHG emission reduction estimates, EPA has not provided an estimate because an approach for estimating GHG emission reductions has not yet been developed and employed or estimating GHG emission reductions may be inherently difficult due to the type of policy or measure. Estimating discrete GHG emission reductions that occur as the result of an individual policy or measure may not be feasible for the following reasons, one or more of which may apply for each policy and measure for which an estimate is not provided:

- *Education program/consumer information*: where estimating GHG emission reductions that result from the program or information is inherently difficult.
- *Enabling policy/program*: where the policy or program facilitates other actions that directly or indirectly lead to GHG emission reductions (e.g., promoting behavior change by consumers or companies; supporting actions by other levels of government; advancing technological innovation) but directly attributing reductions to the policy or program itself is inherently difficult given the range of downstream effects.
- *Policy or program interacts with other policies and measures and/or other policy and economic factors*: where interactions make it difficult to estimate the discrete GHG reduction impact of the policy or program relative to other related factors.
- *Information is not available*: where analysis is not available or data is not currently tracked that would be necessary to estimate GHG emission reductions. This may include situations where modeling or other analyses would be necessary to attribute discrete GHG emission reductions to the policy or measure versus other factors.

U.S. Department of Transportation – Explanations of Unavailable GHG Emissions Reduction Estimates

For Department of Transportation programs without estimates provided, the Department has not yet developed and employed an approach for estimating achieved and proposed GHG emissions reductions. Several programs are exploring the possibility of instituting performance monitoring of GHG metrics for applicable projects that include GHG metrics, but this is not being practiced at this time.

For the DOT's CAFE standards and fuel efficiency programs for the light-duty and medium-duty vehicles sectors for Model Year 2027 and later, EPA's estimate of emissions impacts for EPA's Light-Duty and Medium-Duty Vehicle GHG Standards capture the full effect of both the EPA and DOT programs.

U.S. Department of the Treasury – Explanations of Unavailable GHG Emissions Reduction Estimates

For tax credits and incentives that advance clean energy, energy efficiency, and other climate solutions, GHG emissions reduction estimates are not available for individual tax provisions given uncertainty around how many entities will choose to undertake eligible activities as a result. Additionally, several individual tax provisions from the Inflation Reduction Act have potential interactive effects. While individual estimates are not available, this report's Chapter 3 section on Projections of Greenhouse Gas Emissions and Removals discusses how these tax provisions in aggregate are anticipated to drive GHG emissions reductions across several sectors and play a significant role in achievement of U.S. climate targets.

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Annex 3: Energy-Related CO_2 Emissions

Changes in Methodology since the Fifth Biennial Report

In the 2022 Fifth Biennial Report of the United State of America, energy-related CO_2 emissions projections were obtained from the Energy Information Administration's (EIA) Annual Energy Outlook 2022 Reference Case, which is based on the National Energy Modeling System (EIA-NEMS).

In this Biennial Transparency Report, energy-related CO_2 emissions projections are obtained from multiple models: the Global Change Analysis Model (GCAM); the U.S. Regional Energy Policy economy-wide model linked with the Regional Energy Deployment System (USREP-ReEDS); and a version of the National Energy Modeling System developed by the Office of Policy in the Department of Energy (OP-NEMS).

GCAM

The Global Change Analysis Model (GCAM) is an open-source model developed and maintained by the Joint Global Change Research Institute - a collaboration between the Pacific Northwest National Laboratory and the University of Maryland. This modeling exercise uses GCAM version 7, modeling the US as a single energy and economic region. GCAM runs through 2100 at 5-year timesteps. In addition to energy and economic systems, GCAM also represents water, climate, land use and agriculture systems, and the interactions across them in the U.S. and 31 regions outside of the U.S. As a dynamic-recursive equilibrium model, GCAM solves for equilibrium prices and quantities in hundreds of markets, with solutions depending only on the conditions in the current and sometimes, previous model periods. Additional details on the standard GCAM model can be found in the model documentation.[1]

For this study, exogenous assumptions in GCAM were updated to incorporate important recent socioeconomic and technology trends including Annual Energy Outlook (AEO) socioeconomic assumptions, electric sector projections, from the National Renewable Energy Laboratory's (NREL's) 2023 ATB, and vehicle costs from the Autonomie database. For the purposes of this analysis, we included detailed sector-specific, climate policies across multiple sectors of the U.S. economy. In addition to federal policies, this analysis includes the effects of state level Electric Vehicle (EV) credits and renewable portfolio standards. This version of the model also represents more detailed building sector technologies in the U.S., not available in the standard version of GCAM.

OP-NEMS

OP-NEMS is a version of the National Energy Modeling System (NEMS) developed by the DOE OP.[2] NEMS is the primary model used for economy-wide energy system modeling for the U.S. government and is used to develop key analyses including the U.S. Energy Information Administration (EIA) Annual Energy Outlook. [3]

Several sections of OP-NEMS are based on the DOE Office of Fossil Energy and Carbon Management version of NEMS (FECM-NEMS) developed by OnLocation, Inc, and supported by FECM. OP-NEMS represents new and modified carbon capture, transport, and storage (CCS) technologies that are not covered by the EIA NEMS model including ethanol, natural gas processing, hydrogen in refineries, and cement in industry, and biomass cofiring in power plants. Additional applications of expanded sustainable biofuels production and use were included using inputs provided by the Office of Energy Efficiency and Renewable Energy. OP-NEMS also represents hydrogen production, transportation, and storage. Hydrogen production technologies represented include biomass with and without CCS, natural gas with and without CCS, electrolysis, and nuclear power. Additional model granularity related to building energy efficiency that were developed for the Building Technologies Office (using BTO-NEMS) were also layered on.

USREP-ReEDS (USRR)

USREP-ReEDS is a computable general equilibrium (CGE) model combining the U.S. Regional Energy Policy model (USREP), a 12-region, 14-sector CGE model of the U.S. economy developed at the MIT Joint Program on the Science and Policy of Global Change, and ReEDS, a bottom-up US electricity capacity expansion model developed by NREL.

USREP features a recursive-dynamic approach with five representative households per region, categorized by income, and a government entity managing revenue and expenditure. The model uses national accounts data from the Wisconsin National Data Consortium and incorporates detailed energy and emissions data to ensure accurate simulation of economic and environmental outcomes. Yuan et al. (2019) provides detailed documentation of USREP.

ReEDS is a publicly available linear program that solves for the cost-minimizing combination of investment and operation of the US electric power system; details of the assumptions and data sources in ReEDS can be found in Ho et al. (2021).

In the linked USREP-ReEDS model used for this analysis, electricity output prices and input quantities are determined by the ReEDS electricity model capital, labor, and fuel demand quantities are imposed on the USREP model. Conversely, USREP determines the quantity of electricity output demanded and the price of electricity sector inputs that are imposed on the ReEDS model. The models then iterate to agreement on prices and quantities. Additional documentation of the USREP-ReEDS model and recent developments for analysis of the economic and environmental impacts of the IRA can be found in Woollacott et al. (2023).

Key Variables and Parameters

		Historical			
Key Factor	Units	2005	2010	2015	2020
Energy Intensity	Thousand Btu per Chained (2017) Dollar	6.1	5.7	5	4.4
Population	millions	295.5	309.3	320.6	331.5
Real Gross Domestic Product	Billion chained (2017) dollars	15,988.00	16,789.80	18,799.60	20,234.10
Coal Consumption	Quads	22.8	20.8	15.6	9.2
Natural Gas Consumption	Quads	22.6	24.6	28.2	31.6
Petroleum Consumption	Quads	40.2	35.3	35.4	32.3
Total Primary Energy Consumption	Quads	98.1	95.1	94.5	88.8
Vehicle Miles Travelled	Billion miles	2,991.50	2,969.30	3,097.50	2,897.70

Key Factor	Units	Projected			
		2025	2030	2035	2040
Energy Intensity	Thousand Btu per Chained (2017) Dollar	3-5	3-4	2-4	2-4
Population	millions	338	346	354	361
Real Gross Domestic Product	Billion chained (2017) dollars	21792	23999	26255	29299
Coal Consumption	Quads	7-8	2-5	2-6	1-6
Natural Gas Consumption	Quads	26-31	25-29	25-28	21-30
Petroleum Consumption	Quads	31-36	28-35	25-31	23-31
Total Primary Energy Consumption	Quads	78-97	74-99	79-98	77-98
Vehicle Miles Travelled	Billion miles	3265-3643	3392-4059	3601-4300	3708-4521

Key Factor	Units	Assumptions for 2030 2014 NC	2016 BR	2021 NC	2022 NC	2024 BR
Population	Millions	372.0	359.0	353.0	347.0	346.2
Real GDP	Billion dollars	33,831.2	34,392.8	32,032.6	33,611.0	30,740.2
Energy Intensity	Btu per dollar of GDP	5,926.1	5,448.6	4,531.9	3,993.9	4,086.3
Light-Duty Vehicle Miles Traveled	Billion miles	3,323.0	3,287.0	3,121.0	3,207.0	3,050.1
Average Imported Crude Oil Cost	Dollars per barrel	175.5	129.7	85.0	81.1	91.0
Henry Hub	Dollars per MMBtu	7.5	7.7	4.1	4.0	3.2
Minemouth Coal Price	Dollars per ton	77.7	59.0	35.7	35.8	61.9
Average Electricity Price	Cents per kilowatt-hour	9.7	11.1	10.3	10.6	10.0
All-Sector Motor Gasoline Price	Dollars per gallon	5.1	4.3	3.4	3.3	3.2
Energy Consumption	Quadrillion Btu	103.0	103.0	99.0	100.0	98.6

Note: All dollar values are expressed in 2024 constant dollars and were converted from original values using a GDP chain-weighted price index.

Policies and Measures Included in the 'With Measures' Projections

The Fifth Biennial Report had a policy cut-off date of November 2021, aligned with the cut-off date for the EIA AEO.

The 2024 Policy Baseline used in this report includes additional policies and measures implemented after November 2021, with a policy cut-off date of May 2024.

Notable additions include:

- The Bipartisan Infrastructure Law
- The Inflation Reduction Act
- EPA New Source Performance Standard and Emission Guidelines for the Oil and Gas Sector
- EPA Greenhouse Gas Standards for Light- and Medium-Duty Vehicles
- EPA Greenhouse Gas Standards for Heavy-Duty Vehicles
- EPA Greenhouse Gas Standards for Fossil Fuel Fired Power Plants

- DOE energy efficiency standards for residential appliances including but not limited to, natural gas furnaces, electric and natural gas water heaters, and refrigerators

The following table represents key modeled provisions in the Bipartisan Infrastructure Law and the Inflation Reduction Act.

			Model		
Section	Tax code	Program	GCAM-PNNL	NEMS-OP	USREP-ReEDS
Multi-Sector					
13104	*45Q*	Credit for carbon oxide sequestration (CCS & DAC)	Y	Y	Y
13204	*45V*	Clean hydrogen PTC	Y	Y	N
22001	-	Electric loans for renewable energy	N	Y	Y
50141	-	Funding for DOE Loan Programs Office	N	na	Y
50144	-	Energy infrastructure reinvestment financing	Y	Y	Y
50145	-	Tribal energy loan guarantee program	N	Y	Y
Electricity					
13101	*45*	Production tax credit (PTC) for electricity from renewables	Y	Y	Y
13102	*48*	Investment tax credit (ITC) for energy property	Y	Y	Y
13103	*48(e), 48E(h)*	Low-income communities ITC bonus credit	N	N	Y
13105	*45U*	Zero-emission nuclear power PTC	Y	Y	Y
13701	*45Y*	New clean electricity PTC	Y	Y	Y
13702	*48E*	New clean electricity ITC	Y	Y	Y
13703	*168(e)(3)(B)*	Cost recovery for qualified property (13703)	N	Y	Y
22004	-	USDA assistance for rural electric cooperatives	N	Y	N
50151	-	Transmission facility financing	N	N	N
Transportation					
13201	*40A, others*	Biodiesel and renewable fuels PTC	Y	Y	na
13202	*40*	Second-generation biofuels PTC	Y	Y	na
13203	*40B*	Sustainable aviation fuel PTC	Y	N	na
13401	*30D*	Clean vehicle credit	Y	Y	Y
13402	*25E*	Credit for previously-owned clean vehicles	N	N	N
13403	*45W*	Qualified commercial clean vehicle credit	Y	Y	Y
13404	*30C*	Alternative fuel vehicle refueling property credit	Y	N	na
13704	*45Z*	Clean fuel PTC	Y	Y	na
60101	-	Clean heavy-duty vehicles	N	Y	Y

70002	-	U.S. Postal Service clean fleets	N	Y	Y
Buildings					
13301	*25C*	Energy efficient home improvement tax credit	Y	Y	Y
13302	*25D*	Residential clean energy tax credit	Y	Y	Y
13303	*179D*	Energy efficient commercial buildings deduction	Y	Y	Y
13304	*45L*	New energy efficient home credit	Y	Y	Y
30002	-	Green and resilient (HUD) retrofit program	N	N	Y
50121	-	Home energy performance-based, whole-house rebates	Y	Y	Y
50122	-	High-efficiency electric home rebate program	Y	Y	Y
60502	-	Assistance for federal buildings	N	na	Y
Industry					
13501	*48C*	Advanced energy project credit	N	Y	Y
13502	*45X*	Advanced manufacturing production credit	N	N	Y
50161	-	Advanced industrial facilities deployment program	na	Y	Y
60113	-	Methane emissions reduction program	N	na	N
Multiple	-	Vehicle manufacturing loans/grants	na	na	na
Multiple	-	Low-carbon materials	na	na	na
Multiple	-	Agriculture and forestry provisions	Y	Y	N
Multiple	-	Oil and gas lease sales	N	Y	N
Cross-Cutting Funds and Grants					
60103	-	Greenhouse gas reduction fund	N	Y	Y
60114	-	Climate pollution reduction grants	N	Y	Y
60201	-	Environmental and climate justice block grants	N	Y	Y

Y	Included
N	Not Included
na	Not Applicable

Sensitivity Case Assumptions

Four sensitivity scenarios were run to better represent the uncertainty of the energy system over the next 15 years.

(1) High fuel cost + low renewable energy cost (GCAM and USREP-ReEDS):
   a. 50% lower oil and gas resource recovery and 50% higher drilling costs relative to the Reference case
   b. Annual Technology Baseline 2023 Low Tech costs for generation technologies

(2) High fuel cost (GCAM and OP-NEMS)

a. 50% lower oil and gas resource recovery and 50% higher drilling costs relative to the Reference case

(3) Low fuel cost (GCAM, USREP-ReEDS, OP-NEMS)

a. 50% higher oil and gas resource recovery and 50% lower drilling costs relative to the Reference case

(4) Advanced technology (OP-NEMS)

a. Annual Technology Baseline 2023 Advanced technology costs for generation technologies
b. Higher bonus credits for clean electricity tax credits and commercial renewable energy credit
c. Updated clean vehicle credit estimates
d. Higher electric school bus shares
e. Green cement federal procurement
f. Higher levels of hydrogen demand based on the U.S. National Clean Hydrogen Strategy and Roadmap

Non-CO_2 Emissions

Non-energy CO2 and non-CO2 GHG emissions projections are developed by EPA and USDA. CH4 and N2O projections for the agriculture sector are developed by USDA. Projection methodologies are informed by calculation methodologies published by the IPCC for inventory calculations. EPA used information from the most recent National Inventory Document as the starting point for emissions and underlying activities. EPA projected changes in activity data and emission factors from that base year. Activity data projections include macroeconomic drivers such as population, gross domestic product, and energy use, and source-specific activity data such as fossil fuel production, industrial production, or livestock population and crop production. Where possible, activity projections were drawn from the OP-NEMS projections, USDA Long-Term Agricultural Projections, or EPA Vintaging Model for HFCs from ODS-substitutes. Future changes in emissions factors were based on continuation of past trends and expected changes based on implementation of policies and measures. For the Land Use, Land-Use Change, and Forestry (LULUCF) non-CO_2 projections, the forest-related CH_4 and N_2O values are held constant from the 2022 value as published in the 2024 National Inventory Document. The non-forest LULUCF CH_4 and N_2O values were generated by USDA.

Land Use, Land-Use Change, and Forestry

To better reflect the uncertainties associated with estimating the complex carbon dynamics of different terrestrial ecosystems and related market interactions, and the potential extent of land use change between sectors, the U.S. LULUCF projections through 2040 are presented in Figure 3-38. This range was developed via a collaborative multi-agency effort using different models reflecting alternate modeling techniques. Using different model types in concert allows for a more robust range of projections. These models represent different perspectives on current policies, future macroeconomic outlooks (derived from recent U.S. Government projections for GDP, population, and forest products demand) as well as forest characteristics and management trends.

The high sequestration projection range reflects results from EPA using a dynamic intertemporal optimization forestry model (the Global Timber Model).[4,5,6,7] This model's approach provides a simulation of harvesting, planting, and management intensity (e.g., variety of selection, fertilizer, water management, thinning) decisions that landowners might undertake in response to timber and carbon market demands, including future price expectations. Specifically, it is a dynamic intertemporal economic model that determines timber harvests, timber investments, and land use optimally over time under assumed future market, policy, and environmental conditions. The model generates projections using detailed biophysical and economic forestry data for different countries/regions globally, including the U.S., Europe, China, Canada, Russia, and Japan.

Key updates to the model since the 2022 BR include: 1. Updated data for United States' forests using updated FIA inventory (2023) and new biomass expansion factors for carbon calculations based on the new FIA data. 2. Updated managed forest area to better align with new FIA and 3. Updated land rental assumptions, adjusted to increase rents relative to 2022 projections. Higher rents acknowledge increasing pressure on forests for other uses including set-asides, conservation easements and other conservation, conversion to suburban uses, and other factors associated with rising income. On net, these changes resulted in [slightly smaller projected volume of U.S. forest CO_2 fluxes] in the 'with measures' scenario versus the 2022 BR. The new results show more annual fluctuation than 2022, largely due to the initial age classes. The model also was updated to include macroeconomic data (population and GDP) from AEO2023 for the U.S., though the impacts of this update element were minimal.

EPA also used to inform this analysis is the Forest and Agriculture Sector Optimization Model with Greenhouse Gases (FASOMGHG), which constitutes the middle range of estimates shown. FASOMGHG is a dynamic partial equilibrium optimization model of the U.S. forestry and agriculture sectors.[8,9,10,11] FASOMGHG includes detailed representations of agricultural and forest product markets, contemporary forest inventories, inter-sectoral resource competition and land use change costs, and costs of mitigation strategies. Specifically, FASOMGHG's detailed representation of the U.S. land base is brought into the solution maximizing consumer and producer surplus across the agricultural and forestry sectors, and represents production possibilities for crop production, livestock production, and forestry production. The result provides insight into cross-sectoral inter- and intra-regional responses to policy stimuli reflecting the spatial heterogeneity in production of agriculture and forestry products across the U.S. Key model updates since the 2022 BR include: 1. Updated United States' forests and growth functions based on aggregated Land Use and Resource Allocation model[12] input data which utilizes the FIA inventory (2023) data and biomass expansion factors, the same vintage FIA data used in the GTM model for this exercise, 2. Improved representation of marginal transportation costs of harvested timber. Updates that influence results to a lesser extent include inclusion of the AEO2023 macroeconomic information and demand for crop- and forest-based bioelectricity feedstocks.

The lower sequestration projection range includes results from the United States Forest Service (USFS) Resources Planning Act (RPA) modeling system which includes the Forest Dynamics model,[13] Land Use Change model,[14] and Global Trade Model (FOROM).[15] The RPA modeling system is tied to growth under SSP2, which suggests moderate rates of population and socioeconomic growth in the United States.[16] The Forest Dynamics Model, the Land Use Change Model and FOROM are harmonized based on timber prices and inventory growth rates, and driven by shifts in population, income, and radiative forcing (RCP 8.5 from the NorESM1-M climate model). The land use change projections also account for differential land rents among land uses. The Forest Dynamics Model projects forest ecosystem carbon and other land converted to forest carbon. The FOROM model projects harvested wood products carbon. The WOODCARB II model offered by Skog (2008) is used to project wood products carbon stored in solid waste disposal site Key model updates since the fifth BR include: incorporating new FIA data and methods, incorporating additional management strategies to combat the wildfire crises,[17] planting on additional non-stocked Forest Service land, increased forest management for forest restoration, resilience, and health, and feedback to utilize tree carbon removed during management operations for wood products. The U.S. forest representation for all three modeling approaches above is derived from the USFS U.S. forest inventory data (Forest Inventory and Analysis, FIA). The results include representation of the following forest carbon pools: aboveground live biomass (including trees, seedlings, and saplings), belowground live biomass such as roots, litter, and soil carbon, deadwood, and harvested wood products.

Projected CO_2 estimates for urban forests, agricultural soils and landfilled yard trimmings/food scraps were not produced by the models discussed above but derived by USDA using projection methodologies based off the U.S. Inventory of Greenhouse Gas Emissions and Sinks: 1990-2022.[18] GDP, population, and bioenergy demand within GTM and FASOMGHG are based on

EIA's Annual Energy Outlook 2023 for the U.S. and global parameters are aligned with SSP2 expectations for this analysis.[19] The USDA-FS approach also follows SSP2 expectations as well as observed U.S. population and income changes rates. Increased carbon fertilization (above that embodied in the historic data) and climate change are included in the GTM estimates, but they are not accounted for in the FASOMGHG and USFS models' projections.

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Annex 4: Methodology for Reporting Financial Information

The United States conducted an interagency process to compile methodology documents for all figures for financial assistance provided in the BTR, particularly those figures listed in [Table X] of the Common Tabular Formatting of this BTR. This appendix provides background information on the underlying assumptions and methodologies used to produce information on finance for the First BTR.

Specifically, this appendix describes:

- The overall methodology used for producing information on finance for the BTR;
- The methodology for determining which funds are "climate-specific;"
- The methodology used to specify funds as "committed;"
- The methodology used for reporting core/general contributions through multilateral channels;
- The methodology used for reporting private climate finance mobilized;
- The methodology used for avoiding double counting;
- The methodology used for determining where activities contribute to technology development and transfer or capacity building; and
- Other methodological issues.

This annex addresses elements of paragraphs 119, 121a-c, 121l-o, 121t and 122 of the MPGs.

Overall Methodology for Producing Information on Climate Finance

The First BTR covers U.S. international climate finance for FY 2021-2022 (October 1, 2020, through September 30, 2022). U.S. international climate finance is provided through both bilateral and multilateral channels.

To ensure accurate and comprehensive reporting, interagency data requests were issued government-wide in 2023 and 2024 to request information on climate-related international programs or activities supported with FY 2021-22 resources.

All data was collected and reported in U.S. dollars.

Methodology for Determining Which Funds are "Climate-Specific"

Climate-specific funds reported in the 2024 BTR are those assessed to support climate adaptation or mitigation. This includes activities that were conceived and funded specifically to achieve climate-related objectives, as well as activities that provide climate co-benefits. In cases where only a portion of a program's budget supports climate benefits, only that relevant fraction was counted—not the entire program budget. U.S. international climate finance is categorized under the three thematic pillars:

- Adaptation—increasing resilience to the impacts of climate change;
- Clean Energy—reducing greenhouse gas emissions from energy, industry, and transportation by greater use of renewable energy, increased energy efficiency, and other means; and
- Sustainable Landscapes—reducing greenhouse gas emissions from forests, agriculture, and land use.

Further details on each pillar follow. These details are specific to the data in the 2024 BTR (i.e., data for FYs 2021-22) and are subject to change in future reporting.

Adaptation

Adaptation activities seek to reduce the vulnerability of people, places, and livelihoods to the negative impacts of climate change. Adaptation will help people, communities, and countries anticipate and prepare for current and future climate impacts. Adaptation can save lives, reduce food and water insecurity and malnutrition, and improve health outcomes.

Adaptation may include activities from a broad array of sectors, including but not limited to national and sub-national adaptation planning, agriculture, food security, nutrition, natural resource management, infrastructure, health, water, disaster preparedness and recovery, disaster risk finance, governance, economic growth, education, urban resilience, coastal management, and conflict prevention. Adaptation activities include, but are not limited to activities that support:

Climate Information and Services

- Deepen understanding of climate risks, vulnerabilities, and adaptation solutions;

- Support the expanded development, innovation, use, and delivery of climate information services, decision support tools, and early warning systems;

Direct Investments in Resilient Infrastructure and Adaptation in Key Sectors

- Provide resilient, stable power supply for facilities responsible for continuation of provision of essential services during disasters or other disruptions;
- Develop and support the implementation of flood management infrastructure, management plans, zoning and building codes, or coastal zone management activities, to reduce vulnerability to rising sea levels, saltwater intrusion into ground water, and storm surges;
- Develop and increase the adoption of climate-smart agriculture practices and approaches from farm to landscape levels, promoting management practices that increase the ability of agricultural households and communities to maintain livelihoods in the face of climate change impacts;
- Increase the resilience of water and sanitation products and services, and address water scarcity and unpredictability through improved water resources management;

Health

- Support access to climate resilient health services and facilities and ensure continuation of essential services during disruptions;
- Integrate climate information into health early warning systems and link those to health management information systems and community health systems;
- Provide extra support for vulnerable populations, such as children and pregnant people, and for patients on treatment (especially for TB and HIV/AIDS) in areas that regularly experience climate-related food insecurity to ensure the treatment is uninterrupted and is effective;
- Address air pollution worsened by increasing temperatures associated with climate change;

Governance, Policies, and Enabling Environments

- Support governance and management processes to address climate-related risks, including activities that improve the capacity of national, sub-national, and municipal level governments to assess and embed climate risks into their budgets, plans, policies, and operations, thereby improving coordination by government institutions on climate change adaptation policy and implementation;

- Increase public, civil society, and private sector awareness of and participation in climate change adaptation policy, planning, and action;
- Support locally-led adaptation that enables climate-vulnerable communities and people to meaningfully participate in and lead adaptation-related decisions;
- Strengthen government and local community response and communications capacity for climate change-related disasters, including supporting governments to develop comprehensive risk management and anticipatory financing plans, as well as develop shock responsive and adaptive social protection programs that reduce negative impacts of climate shocks and stresses;
- Promote or establish critical preconditions for future adaptation activities, including the development or reform of planning, policies, laws, regulations, and institutions;
- Strengthen capacity to access finance for adaptation and develop bankable investments, including climate and disaster risk financing, and private capital;

Migration

- Strengthen local governance and inclusive approaches that empower and increase the resilience of populations most vulnerable to climate impacts, including migrants; and
- Address climate-related migration and/or planned relocation by working with people in place and migrants to limit displacement and support safer and more productive migration, including in sending and receiving communities.

Clean Energy

Clean energy activities seek to enable reliable, efficient, sustainable, and secure energy systems by promoting and enabling the production, procurement, and use of zero-carbon and clean energy, and greenhouse gas mitigation and abatement technologies. Clean energy will help to reduce the emission of greenhouse gasses that contribute to climate change. All non-land-use-based activities that aim to reduce the emission of greenhouse gasses that contribute to climate change are included under this pillar. Clean energy activities include, but are not limited to, the following activities that support:

Direct Investments in Clean Energy

- Promotion, deployment, and management of renewable energy in all end-use sectors;

- Decarbonization technologies and pathways across energy-producing and -consuming sectors, including power, transport, industry, and buildings;
- Use of renewable energy and non-carbon intensive technologies to produce alternative fuels such as hydrogen;
- Distributed energy resources such as photovoltaic (PV) power and energy storage;
- Accelerated retirement of emissions-intensive power plants (especially coal-fired facilities), including technical, financial, environmental, and social activities necessary to enable this objective;
- Reduction of methane, black carbon, and hydrofluorocarbons, collectively known as short-lived climate pollutants (SLCPs);
- Nuclear for production, direct use, and electricity generation, including the improvement of existing generation, including expenditures that are intended to integrate renewable energy systems into advanced nuclear technologies;
- Utilization of Carbon Capture, Utilization, and Storage (CCUS) technologies and/or SLCP mitigation approaches to reduce the emissions intensity of existing coal, oil, and natural gas equipment or infrastructure;

Energy Storage, Efficiency, and Management

- Energy storage, smart grids, and the deployment and management of energy efficiency and demand-side management measures (including efficient appliances and machinery, building designs, and consumer behavior change) designed to reduce energy intensity and/or moderate demand;
- Investments in transmission and system operations that enable or increase the evacuation, transport and trade in clean energy, including energy storage;
- Transmission and distribution infrastructure that advances clean-energy goals. This includes such infrastructure that substantially reduces transmission and distribution losses; connects to current or future clean energy generation; promotes regional energy integration that advances reserve sharing and grid stability;
- End-use energy efficiency and flexible demand, including in the transportation, industry, and building and construction sectors;

Governance, Policies, and Enabling Environments

- Facilitation of the design of or technical support for the development and implementation of clean energy programs and their components;

- Reforms that significantly improve cost recovery and establish the financial capacity in the power sector to make investments in clean energy;
- Market-based instruments, including MRV, and power sector planning, including advanced considerations beyond just least cost, such as resilience and the environment, to address environmental externalities;
- Transport programs such as analysis and planning, regulatory, and policy reform, and financing and market development for electric vehicles and/or low-carbon mass transit and transport alternatives;
- Preparation and implementation of clean energy components of nationally determined NDCs and long-term low greenhouse gas emission development strategies;
- Promotion or establishment of critical preconditions for future clean energy activities, including the development or reform of planning, policies, laws, regulations, and institutions;
- Workforce development and financial system strengthening designed to enhance the ability of countries to effectively staff and finance activities related to clean energy deployment, energy efficiency and other areas covered under this definition; and

Critical Minerals and Supply Chains

- Clean energy technology supply chain resiliency, such as efforts to sustainably diversify, commercialize, and govern critical energy mineral sector resources, or to encourage the inclusion of responsible mineral supply chain sourcing principles in national climate strategies and procurement plans.

Sustainable Landscapes

Sustainable landscapes activities seek to reduce greenhouse gas emissions from land by promoting sustainable land use practices that reduce emissions or increase carbon sequestration. These programs support the implementation of natural climate solutions, which reduce net greenhouse gas emissions through the conservation, management, and restoration of forests, peatlands, mangroves, and other ecosystems, as well as low emissions practices in agriculture and other production systems, while supporting economic growth, resilience, and other co-benefits.

Sustainable landscapes activities focus on reducing emissions and can include low emissions land use planning, REDD+, improved data and analytical tools, monitoring, reporting, and verification systems; enabling laws and policies, effective implementing institutions, social and environmental safeguards, access to finance, mobilizing private climate finance, work with banks, financial institutions, and participants in commodity supply chains, technical assistance, promotion of rule-of-law, governance, transparency, and programs to counter corruption, promoting enabling environments, including for engagement in market mechanisms and results-based finance, assistance with national policy, economic incentives, and low emissions agriculture. Sustainable landscapes activities include, but are not limited to, activities that support:

Direct Investments in Sustainable Landscapes

- Biodiversity conservation that leads to reduced deforestation and associated emissions;
- Creation or effective management of protected areas where there is a risk of illegal deforestation, degradation, or land conversion that would result in increased emissions;

Land Tenure

- Improving land tenure systems that result in communities incentivized to manage and restore forested areas, resulting in increased carbon sequestration in tree biomass;
- Land tenure reform or improved land use planning for agriculture that results in reducing the conversion of high carbon natural habitats and associated emissions;

Ecosystem Restoration or Protection

- Restoring wetlands to increase fisheries production that also returns wetland carbon storage potential, thus increasing carbon sequestration;
- Increasing tree cover on the landscape through practices such as living fences, shelterbelts and windbreaks, boundary trees and alley cropping, resulting in increased carbon sequestration;

Agriculture

- Agricultural activity that promotes the incorporation of agricultural residue, leading to lower use of nitrogen fertilizers and associated emissions;
- Working on pasture management to implement improved grazing techniques and fire reduction methods, resulting in improved grassland health and greater carbon sequestration in the soil; and

Governance, Policies, and Enabling Environments

- Developing economic incentives or alternative livelihoods to reduce the conversion of ecosystems in order to protect biodiversity, watersheds, or other ecosystem services that also will result in reduced emissions.

Methodology Used to Specify Funds as “Committed”

The common tabular format for Paris Agreement BTRs includes two options for the status of financial support: “committed” and “disbursed.” All public financial support reported in the 2024 BTR is considered to be “committed.” Details regarding the meaning of “committed” across each of the channels of international climate finance follow:

For *Congressionally-appropriated funds,* funds reported as committed are those that have been appropriated by Congress and allocated by the funding agency for a specific fund, country, project, or program. All such funds are considered to be official development assistance.

For *development finance*, funds reported as committed are those for which a commitment letter is signed and executed by all parties. All such funds are considered to be other official flows.

For *export credit*, funds reported as committed are those authorized by the Export-Import Bank of the United States for that particular purpose. All such funds are considered to be other official flows.

Methodology Used for Reporting Core/General Contributions Through Multilateral Channels

For core/general contributions to multilateral channels that do not include a climate-specific component, data shown in the 2024 BTR reflect total U.S. contributions to covered institutions, as collected as part of the U.S. government’s reporting to the OECD Development Assistance Committee. While a portion of these funds is used by the recipient institutions to finance climate change activities in developing countries, the United States does not include these non-climate-specific contributions in topline numbers presented in the 2024 BTR.

Methodology Used for Private Climate Finance Mobilized

As stated above, the United States defines private climate finance mobilized as the amount of additional finance invested in supporting climate change mitigation and/or adaptation in a developing country as a result of U.S. government assistance, whether financial or non-financial. Private climate finance mobilized includes private finance for climate-relevant activities that has been mobilized by public finance or by a public policy intervention, including technical assistance to enable policy and regulatory reform.

To account for mobilized private climate finance, we assess the amount of private finance mobilized on an activity-by-activity basis and report on private finance associated with activities if there is a clear causal link between a public intervention and private finance and where the activity would not have moved forward, or moved forward at scale, in the absence of the U.S. government's intervention. To avoid double counting, all finance private climate mobilized refers to the private sector and excludes finance from developing country governments or other contributor governments.

This BTR includes private climate finance mobilized during FY 2021 and 2022. The methodological approach for this differs depending on the channel of U.S. assistance.

For *Congressionally appropriated* support, private climate finance mobilized is accounted for during the fiscal year in which it is mobilized, regardless of the year in which U.S. support was provided. This is due to the multi-year nature of most activities implemented through this channel.

For *development finance,* private climate finance mobilized is accounted for during the same fiscal year as when the finance is reported as provided. This is due to the fact that most activities implemented through this channel mobilize finance through co-financing at the time of deal closure.

For *export credit,* private climate finance mobilized is accounted for during the same fiscal year as when the finance is reported as provided. This is due to the fact that most activities implemented through this channel mobilize finance through co-financing at the time of deal closure.

For *policy support*, private climate finance mobilized is accounted for during the fiscal year in which it is mobilized, regardless of the year in which U.S. policy support was undertaken. This is due to the multi-year nature of most activities implemented through this channel and the high complexity associated with identifying causal linkages between policy support and mobilization.

The United States does not report private climate finance mobilized by *multilateral funds*.

The U.S. methodology for defining and tracking private climate finance mobilized aims to ensure that reporting encourages and incentivizes the most effective use of climate finance, while accurately reflecting the full breadth of U.S. support.

Current data and methodological limitations prevent the United States in some cases from:

- Attributing private climate finance mobilized to specific instances of public finance provision, owing to the multi-year nature of many activities;
- Reporting mobilization at the project level due to the confidential nature of deal terms; and
- Capturing the full breadth of private climate finance mobilized through public policy interventions.

As such, estimates throughout this chapter are necessarily partial and omit some—possibly a substantial amount of—private climate finance mobilized.

Methodology Used to Avoid Double Counting

For support, the United States exclusively reports support provided by U.S. government entities, thus avoiding double counting with other contributor countries.

For private climate finance mobilized, U.S. government agencies disaggregate data into four categories: international public (other donors), international private, domestic public (recipient country), and domestic private. Public resources mobilized from other contributor countries or recipient countries are not included as private climate financed mobilized.

In cases where a program has multiple recipients, it is reported as a regional or global project, thereby avoiding double counting across countries.

Methodology for Technology Development and Transfer and Capacity Building Methodology

Departments and agencies reporting on climate finance activities are also requested to identify whether an activity supports technology development and transfer and/or capacity building. “Technology development” activities are defined in accordance with U.S. Office of Management and Budget Circular A-11, Section 84: “Research and experimental development activities are defined as creative and systematic work undertaken in order to increase the stock of knowledge—including knowledge of people, culture, and society—and to devise new applications using available knowledge." Activities that support technology transfer are defined in accordance with the IPCC definition of technology transfer: "The exchange of knowledge, hardware and associated software, money and goods among stakeholders, which leads to the spread of technology for adaptation or mitigation. The term encompasses both diffusion of technologies and technological cooperation across and within countries."[iv] Activities that support capacity building are defined as programs or/and activities that help establish the resources needed to fulfill a mission or achieve a goal defined by the program and/or activity.

Other Methodological Issues

Common Tabular Format Tables include three categories for "type of support:" Mitigation, Adaptation, Crosscutting. U.S. data are presented as follows:

- All U.S. "clean energy" funds, projects, programs, and activities are listed as Mitigation.
- All U.S. "sustainable landscapes" funds, projects, programs, and activities are listed as Mitigation.
- All U.S. "adaptation" funds, projects, programs, and activities are listed as Adaptation.

Annex 5: Information on Support Provided

Contents

Public Support Provided

This table covers MPG paragraph 123.

Recipient	Title of the Project, Program, Activity or Other	Amount (Face Value USD millions)	Status	Channel	Funding source	Financial instrument	Type of support	Sector
Global	2021, Center for International Forestry – World Agroforestry (CIFOR-ICRAF) Research Partnership, Mitigation	0.15	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Global	2021, Center for International Forestry Research (CIFOR) Biodiversity Research, Mitigation	0.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Uganda	2021, Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot, Adaptation	0.111	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2021, Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot, Mitigation	0.111	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Global	2021, Low Emission Development Strategies Global Partnership (LEDS-GP), Mitigation	2.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy

Global	2021, SEVIR Activity, Mitigation	0.65	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Uganda	2021, Uganda Agricultural Research Activity, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Philippines	2022, Amacan Geothermal Project Feasibility Study, Mitigation	0.41	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Center for International Forestry – World Agroforestry (CIFOR-ICRAF) Research Partnership, Mitigation	0.35	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Uganda	2022, Country Health Information Systems and Data Use (CHISU), Adaptation, Uganda - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation - Climate Specific	0.065	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
India	2022, Jharia Coal Mine Methane Project Feasibility Study, Mitigation	0.79	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Philippines	2022, Offshore Wind and Battery Storage Project Feasibility Study, Mitigation	0.65	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, SMART4TB, Adaptation, first	1.125	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Uganda Agricultural Research Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Thailand	2022, VAO Energy Plastic Recycling Plant Feasibility Study, Mitigation	0.7	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Peru	2021, CINCIA ACIERTA: Alliance for Science & Ecosystem Recovery, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Peru	2021, CINCIA ACIERTA: Alliance for Science & Ecosystem Recovery, Mitigation	0.9	Committed	Bilateral	ODA	Grant	Mitigation	Other
Peru	2021, Combatting Environmental Crimes in the Peruvian Amazon, Mitigation, first	2.8	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2021, Forest Data Partnership, Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Bangladesh	2021, FTF Climate Smart Agriculture Activity, Adaptation-Climate Specific	1.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2021, SERVIR West Africa 2 (Follow-on to SERVIR WA), Adaptation	0.833	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Adaptation	0.315	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Adaptation, first	0.585	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Mitigation	0.1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Chad, Côte D'Ivoire, Djibouti, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Togo, Tanzania, Uganda, Zambia	2021, SEVIR African Regional Data Hub Funding, Adaptation	1.63	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2021, Smart Utilities Promoting Energy Reform (SUPER), Mitigation	0.361	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2021, Southeast Asia Smart Power Program, Mitigation	0.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Technical Assistance Facility to Mobilize Private Capital (CRAFT), Adaptation	2.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Industry
Africa Regional	2021, Weather and Climate Information Services Activity, Adaptation	0.857	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Laos	2022, Southeast Asia Smart Power Program (Buy in), Mitigation	3	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Supply Chain Technical Assistance, Mitigation, first	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Global	2022, Coalition for Operational Research on Neglected Tropical Diseases (COR - NTD), Adaptation	0.25	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)

Uzbekistan	2022, Digital Twin Water Pilot Project Feasibility Study, Adaptation	0.45	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Peru	2021, Amazon Business Alliance, Mitigation	0.779	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Global	2021, Clean Technology and Trade Partnership Initiative's Accelerating Clean Energy Transitions Technology Needs Assessment, Mitigation	0.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Clean Technology Trade and Partnership Initiative, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, First Movers Coalition, Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Paraguay	2021, Forest Conservation Agriculture Alliance (FCAA), Mitigation- Climate Specific	0.85	Committed	Bilateral	ODA	Grant	Mitigation	other
Global	2021, International Methane Emissions Observatory, Mitigation	0.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, LASER - Improving the Air Pollution Monitoring and Management of Vietnam with Satellite PM 2.5 Observation, Adaptation	0.165	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Ecuador	2021, Quito Electric Bus and Intelligent Transportation System (ITS) Modernization Technical Assistance for the Empresa Publica Metropolitana de Transporte de Pasajeros de Quito (EPMTPQ, Mitigation	0.97	Committed	Bilateral	ODA	Grant	Mitigation	Transport
Peru, Colombia & Brazil	2021, SERVIR Amazonia, Mitigation	1.026	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Brazil	2021, Smart RJ Concessionaria, Mitigation	174	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Cross-cutting
Nigeria	2021, Sosai Sustainable Minigrids for Energy Access and Social Inclusion Feasibility Study in Nigeria, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2021, Supply Chain Technical Assistance, Mitigation	0.45	Committed	Bilateral	ODA	Grant	Mitigation	Other
Kenya	2021, Sustainable Conservation and Management of Maasai Mara Landscape, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2021, Technical Collaboration on Advanced Energy Systems, Mitigation	0.764	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Benin	2021, Technology for Energy Access and Mini grid Development Technical Assistance in Benin, Mitigation	0.99	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Thailand	2021, Utility Data Management Strategy and Implementation Plan Technical Assistance in support of the Provincial Electricity Authority (PEA) in Thailand, Mitigation	1.25	Committed	Bilateral	ODA	Grant	Mitigation	Energy
India	2022, BSES Yamuna Power Limited Energy Integration Roadmap Technical Assistance, Mitigation	0.74	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Pakistan	2022, Climate Smart Agriculture, Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Climate Smart SME Platform, Adaptation	0.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Country Health Information Systems and Data Use (CHISU), Adaptation, Multi-Country - Climate Specific	0.06	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Ecuador	2022, Electricity Transmission Digital Modernization Technical Assistance, Mitigation	0.79	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Nigeria	2022, Feed the Future Nigeria Agricultural Extension and Advisory Services and Technology Promotion Activity, Adaptation	0.151	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Forest Data Partnership, Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Forest Data Partnership, Mitigation, first	1.55	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Forest Data Partnership, Mitigation, second	0.9	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
India	2022, FS India Solar Ventures Private Limited, Mitigation	500	Committed	Bilateral	OOF	Concessional loan	Mitigation	Energy
Bangladesh	2022, FTF Climate Smart Agriculture Activity, Adaptation- Climate Specific	2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2022, FTF Climate Smart Agriculture Activity, Mitigation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Africa Regional	2022, FTF Soil Fertility Technology Adoption, Policy Reform and Knowledge Management Project (IFDC), Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Global	2022, FTF Soil Fertility Technology Adoption, Policy Reform and Knowledge Management Project (IFDC), Mitigation	5	Committed	Regional	ODA	Grant	Mitigation	Agriculture
Vietnam	2022, Information Technology (IT) Roadmap 2.0 Technical Assistance, Mitigation	0.94	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Jamaica	2022, Jamaica Emergency Communications System Modernization Technical Assistance, Adaptation	0.74	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Malaria Database, Adaptation - Climate Specific	1.005	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Ecuador	2022, Manabi Intelligent Transportation System (ITS) Modernization Technical Assistance, Adaptation	0.24	Committed	Bilateral	ODA	Grant	Adaptation	Transport
Mexico	2022, Mérida Intelligent Transportation System (ITS) Modernization Technical Assistance, Mitigation	0.88	Committed	Bilateral	ODA	Grant	Mitigation	Transport
Global	2022, Nutritional Data Services, Adaptation	5.815	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Malawi	2022, PMI Country Health Information Systems and Data Use (CHISU), Adaptation - Climate Specific	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Other
Costa Rica	2022, Power Control Center Roadmap Technical Assistance, Mitigation	0.72	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Ghana	2022, Resiliency in Northern Ghana II - Systems Strengthening (Technical Assistance), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ghana	2022, Resiliency in Northern Ghana II - Systems Strengthening (Technical Assistance), Mitigation	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Ukraine	2022, Small Modular Reactor (SMR) Licensing Gap Analysis Technical Assistance, Mitigation	1.1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2022, Smart Grid Roadmap Technical Assistance for Power Cell, Mitigation	1.49	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Smart Utilities Promoting Energy Reform (SUPER), Mitigation	0.75	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Global	2022, SMART4TB, Adaptation	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
St. Lucia	2022, Solar-Plus-Storage Microgrids Technical Assistance, Mitigation	0.67	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Asia Regional	2022, Southeast Asia Climate-Smart Transportation Reverse Trade Mission, Mitigation	0.49	Committed	Regional	ODA	Grant	Mitigation	Transport
Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Adaptation	0.67	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Energy

Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Adaptation, first	2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Energy
Cambodia, Laos, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Mitigation	0.81	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Mitigation, Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2.67	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Cambodia, Laos, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Mitigation, first	1.11	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, TB Data, Impact Assessment, and Communications (TB DIAH), Adaptation	0.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Technical Assistance Facility to Mobilize Private Capital, Adaptation	3.8	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Industry
El Salvador	2022, Water Utility Energy Efficiency Technical Assistance, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Mexico	2021, Centro de Formación Integral para Promotores Indígenas, A.C. (CEFIPI) Cross-Cutting Training Program in Mexico, Adaptation	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Botswana	2021, Climate Smart Agriculture Research in Botswana, Adaptation- Climate Specific	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Philippines	2021, Climate Smart Agriculture Research in the Philippines, Adaptation- Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Zambia	2021, Climate-Smart Dairy Production Research in Zambia, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Mozambique	2021, Construction of a Research and Conservation Center, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Other
Peru	2021, Corn Research in Peru, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Trinidad and Tobago	2021, Crop Virus Research in Trinidad and Tobago, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nigeria	2021, DayStar Commercial and Industrial Distributed Energy Resources Feasibility Study in Nigeria, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
India	2021, Dwarka Hybrid Renewables and Energy Storage Project Feasibility Study in India, Mitigation	0.84	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Nigeria	2021, EM-ONE Solar Mini-Grids Feasibility Study, Mitigation	0.98	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Africa Regional	2021, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation - Climate Specific	0.2	Committed	Regional	ODA	Grant	Adaptation	Other
Uganda	2021, Grain/Corn Storage Resilience Research in Uganda, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Brazil	2021, Grassland Research in Brazil, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Liberia	2021, Higher Education for Conservation Activity, Mitigation	0.7	Committed	Bilateral	ODA	Grant	Mitigation	Other
Sierra Leone	2021, Hybrid Power Generation in Nitti Feasibility Study in Sierra Leone, Mitigation	0.55	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Mexico	2021, La Pluma Utility-Scale Solar Feasibility Study in Mexico, Mitigation	0.79	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Pakistan	2021, Landhi Cattle Colony Biomethane Project Feasibility Study in Pakistan, Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2021, LASER - Avoid the TRAP: Multi-sector collaboration between health, education and environment to minimize the impact of traffic-related air pollution (TRAP) on children in Ho Chi Minh City, Vietnam, 2021-2022, Adaptation - Climate Specific	0.134	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Brazil	2021, Maize Plant Research in Brazil, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ghana	2021, Market Systems and Resilience Activity, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Uganda	2021, Peace Corps (PC) Uganda Community Food Security, Health, and Education Capacity Building Activity, Adaptation-Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Guatemala	2021, Safe Return to School Plus, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Sharing Environment and Energy Knowledge (SEEK), Adaptation	0.4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	other
Global	2021, Sharing Environment and Energy Knowledge (SEEK), Mitigation	0.321	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Thailand	2021, Siam Cement Group (SCG) Fleet Decarbonization Project Feasibility Study in Thailand, Mitigation	0.74	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Philippines	2021, Sun Keeper Utility-Scale Solar Project Feasibility Study, Mitigation	0.53	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Indonesia	2021, Sustainable Energy for Indonesia's Advancing Resilience (SINAR), Mitigation	4.417	Committed	Bilateral	ODA	Grant	Mitigation	other

West Bank and Gaza	2021, Technical and Vocational Education Training (TVET), Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
India	2021, Water Management Research in India, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
West Bank and Gaza	2022, "Forsah" Technical and Vocational Education Training (TVET) Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Adaptation Training Center, Adaptation	9.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bhutan	2022, Bhutan Economic and Education Support Activity (BEESA), Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Building Global Regulatory Capacity Building on Decarbonization and Resilience, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Center for International Forestry Research (CIFOR) Biodiversity Research, Mitigation	0.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Climate Action Partnership for Education (CAPE) Broad Agency Announcement (BAA), Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Pakistan	2022, Climate Smart Energy, Mitigation, first	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Benin	2022, Cotonou Entomological Research Center (CREC), Adaptation	0.825	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Nigeria	2022, Education and Training, Adaptation - Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Adaptation	Other
Romania	2022, FEED Study, Mitigation	8	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Honduras	2022, Global Health Security Capacity Building, Adaptation - Climate Specific	0.168	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation, first - Climate Specific	0.3	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Global	2022, Global Health Training, Advisory, and Support Contract (GHTASC), Adaptation, first - Climate Specific	0.985	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Peru	2022, International Education and Training - Peru, Adaptation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other
Asia Regional	2022, International Education and Training Program, Adaptation - Climate Specific	0.04	Committed	Regional	ODA	Grant	Adaptation	Other
Jordan	2022, International Education and Training, Adaptation - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Other

Honduras	2022, International Education and Training, Adaptation, Honduras - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kosovo	2022, International Education and Training, Adaptation, Kosovo - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Lebanon	2022, International Education and Training, Adaptation, Lebanon - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Other
Mexico	2022, International Education and Training, Adaptation, Mexico - Climate Specific	0.21	Committed	Bilateral	ODA	Grant	Adaptation	Other
North Macedonia	2022, International Education and Training, Adaptation, North Macedonia - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Sierra Leone	2022, International Education and Training, Adaptation, Sierra Leone - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Other
Thailand	2022, International Education and Training, Adaptation, Thailand - Climate Specific	0.07	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, International Education and Training, Adaptation, Uganda - Climate Specific	0.07	Committed	Bilateral	ODA	Grant	Adaptation	Other
Rwanda	2022, Kigali Innovation Smart City Feasibility Study, Adaptation	0.16	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Rwanda	2022, Kigali Innovation Smart City Feasibility Study, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2022, Knowledge SUCCESS, Adaptation	0.299	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
El Salvador	2022, Light-Emitting Diode (LED) Streetlighting Feasibility Study, Mitigation	0.96	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Morocco	2022, Marrakech Smart Grid Feasibility Study, Mitigation	1.26	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Thailand	2022, One Health Workforce - Next Generation (Southeast Asia One Health University Network Transition Award), Adaptation - Climate Specific	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Philippines	2022, Ore-to-Nickel and Cobalt Processing Facility Feasibility Study, Mitigation	1.03	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Pakistan	2022, Pakistan Training and Education, Adaptation - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Egypt	2022, Partnerships for Educational Progress, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Tonga	2022, Power Sector Decarbonization Feasibility Study, Mitigation	1.49	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Somalia	2022, Professionalization and Education Activity, Adaptation, first - climate specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Somalia	2022, Professionalization and Education Activity, Adaptation, second - climate specific	0.051	Committed	Bilateral	ODA	Grant	Adaptation	Other
Laos	2022, Supporting High Education Quality Improvement Program in Lao PDR, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kenya	2022, Sustainable Conservation and Management of Maasai Mara Landscape, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Democratic Republic Of The Congo	2022, Virunga Security and Technical Training, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2022, West Africa Power Pool 225 Kilovolt Côte d'Ivoire-Liberia Transmission Interconnection Project Feasibility Study, Mitigation	0.28	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Alternatives to Charcoal, Mitigation	1.39	Committed	Regional	ODA	Grant	Mitigation	Energy
Global	2021, Climate Fellows, Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Peru	2021, Combatting Environmental Crimes in the Peruvian Amazon, Adaptation	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Peru	2021, Combatting Environmental Crimes in the Peruvian Amazon, Mitigation, second	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Other
Bangladesh	2021, Community Partnerships to Strengthen Sustainable Development (COMPASS), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Global	2021, Conservation Volunteers, Mitigation	0.32	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Africa Regional	2021, Conserving Critical Congo Basin Forests, Mitigation	2.8	Committed	Regional	ODA	Grant	Mitigation	other
Asia Regional	2021, Forest for Water and Prosperity, Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	other
Global	2021, Forest Investment Development Facility (ForInvest), Mitigation	5.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Brazil, Colombia, Ecuador, Peru	2021, Forest Management and Fire Regional Program., Mitigation	0.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Vietnam	2021, FUV Growth and Sustainability, Mitigation	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture

Cambodia, Indonesia, Philippines, Thailand, Vietnam	2021, Green Invest Asia, Mitigation	1.562	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Cambodia, Indonesia, Philippines, Thailand, Vietnam	2021, Green Invest Asia, Mitigation, first	1.876	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Improving Collaborative Conservation and Management of Transboundary Natural Resources in East Africa, Adaptation	0.05	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Improving Collaborative Conservation and Management of Transboundary Natural Resources in East Africa, Mitigation	0.1	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Philippines	2021, Investing in Sustainability and Partnerships for Inclusive Growth and Regenerative Ecosystems (INSPIRE), Mitigation	0.9	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Luangwa Livelihood and Conservation, Mitigation	0.83	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Malawi	2021, Modern Cooking for Healthy Forests in Malawi - Tiphike Mwa Makono, Adaptation	0.627	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Malawi	2021, Modern Cooking for Healthy Forests in Malawi - Tiphike Mwa Makono, Mitigation - Climate Specific	1.85	Committed	Bilateral	ODA	Grant	Mitigation	other
Colombia	2021, Nature Tourism, Mitigation	0.164	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Global	2021, Paris Agreement Transparency Accelerator, Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Natural Resources Management (NRM), Adaptation- Climate Specific	0.354	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Natural Resources Management (NRM), Adaptation, firsr- Climate Specific	1.315	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Natural Resources Management (NRM), Mitigation- Climate Specific	1.5	Committed	Bilateral	ODA	Grant	Mitigation	other
Africa Regional	2021, Transaction Advisory Support to the Government of Malawi on the Mpatamanga Hydroelectric Power Station, Mitigation	0.267	Committed	Regional	ODA	Grant	Mitigation	Energy
Niger	2022, Groundwater Research, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Global	2021, Advancing Capacity for the Environment (ACE), Adaptation	0.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2021, Advancing Capacity for the Environment (ACE), Mitigation	0.722	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Mexico	2021, Applying the "LandScale Standard" Tool, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2021, Business Case for Collective Landscape Action, Mitigation, first	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Industry
Global	2021, Business Case for Collective Landscape Action, Mitigation, second	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Industry
Global	2021, Clean Cities Blue Ocean (CCBO) Task Order, Adaptation	2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Mozambique	2021, Conservation Works Activity, Mitigation	3.515	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Philippines	2021, Evidence-Driven Collaborating, Learning, and Adapting (CLAIMDev), Adaptation	0.048	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2021, Evidence-Driven Collaborating, Learning, and Adapting (CLAIMDev), Mitigation, Other	0.095	Committed	Bilateral	ODA	Grant	Mitigation	Other
Ghana	2021, Feed the Future Ghana Fisheries Recovery Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)
Bangladesh	2021, FTF Bangladesh Livestock and Nutrition Activity, Adaptation	0.45	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2021, FTF Bangladesh Livestock and Nutrition Activity, Mitigation	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Other
Vietnam	2021, Fulbright University Vietnam Corporation, Mitigation	1.5	Committed	Bilateral	OOF	Concessional loan	Mitigation	Other
Global	2021, Innovative Finance For Nature, Mitigation	0.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting

Global	2021, LEAF Coalition, Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Vietnam	2021, Learns Program, Adaptation	0.063	Committed	Bilateral	ODA	Grant	Adaptation	Other
Vietnam	2021, Learns Program, Mitigation	0.127	Committed	Bilateral	ODA	Grant	Mitigation	Other
Vietnam	2021, Learns Program, Mitigation, first	0.18	Committed	Bilateral	ODA	Grant	Mitigation	Other
Asia Regional	2021, Regenerative Pay for Success Mechanism, Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Other
Mexico	2021, Southern Mexico - Generating Employment and Sustainability (SURGES), Mitigation	5.188	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Vietnam	2022, Bac Lieu Transmission Line Project Feasbility Study, Mitigation	1.34	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Climate Monitoring, Evaluation, Training, and Accountability, Adaptation	0.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Enhancing Nutrition Monitoring Evaluation Research and Learning in the Health Sector (NuMERAL), Adaptation - Climate Specific	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Global Health Training, Advisory, and Support Contract (GHTASC), Adaptation - Climate Specific	0.79	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Global Health Training, Advisory, and Support Contract (GHTASC), Mitigation - Climate Specific	0.01	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, Global Health Training, Advisory, and Support Contract (GHTASC), Mitigation, first - Climate Specific	0.025	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Nepal	2022, Knowledge-based Integrated Sustainable Agriculture and Nutrition Project-II (KISAN II), Adaptation- Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
West Bank and Gaza	2022, Small and Medium Enterprise Assistance for Recovery and Transition (SMART), Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Middle East Regional	2022, Technical and Administrative Support for the Middle East Regional Cooperation and Cooperative Development Research Programs (support contract for MERC), Adaptation	0.1	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, responsAbility Climate-Smart Agriculture and Food Systems Fund SICAV RAIF, Adaptation- Climate Specific	19	Committed	Multi-Bilateral	OOF	Loan guarantee	Adaptation	Cross-cutting
Asia Regional	2021, "Lukautim Graun" (Look after the environment), Adaptation	2.8	Committed	Regional	ODA	Grant	Adaptation	Forestry
Kenya	2021, Accelerating Institutional and Food Systems Development Activity (AIFSD), Adaptation- Climate Specific	0.175	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Africa Regional	2021, Accelerating Women's Empowerment in Energy (AWEE), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Mexico	2021, Acción Social Samuel Ruiz A.C. (ASSR) Indigenous Support Program in Mexico, Adaptation	0.24	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Latin America & Caribbean Regional	2021, Adaptation Activity - Green Cities Buy-In, Adaptation, Regional, Adaptation	0.66	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Adaptation/Climate change activity, Africa Regional	0.2	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Indonesia, Vietnam, Thailand, Philippines, Laos, Burma, Bangladesh	2021, Advanced Energy Partnership for Asia, Mitigation	0.36	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Indonesia	2021, Advancing Cocoa Agroforestry towards Income, Value, and Environmental Sustainability (ACTIVE) partnership, Adaptation	0.125	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Indonesia	2021, Advancing Cocoa Agroforestry towards Income, Value, and Environmental Sustainability (ACTIVE) partnership, Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	other
Global	2021, Advancing Modern Power through Utility Partnerships (AmpUp), Mitigation	1.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Advancing Nutrition, Adaptation	0.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Asia Regional	2021, Advancing the U.S.-India Partnership Support Mechanism, Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Forestry
India	2021, Advancing the U.S.-India Partnership Support Mechanism, Mitigation, India	0.4	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, Africa Adaptation Initiative, Adaptation	5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Africa Disaster Risk Finance, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Africa Trade and Investment (ATI) Climate Finance for Low-Emissions Agriculture activity, Mitigation- Climate Specific	0.5	Committed	Regional	ODA	Grant	Mitigation	other
Nepal	2021, Agricultural Inputs, Adaptation	1.05	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nepal	2021, Agricultural Transformation Activity, Adaptation, Nepal, first	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Nepal	2021, Agricultural Transformation Activity, Adaptation, Nepal, fourth	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nepal	2021, Agricultural Transformation Activity, Adaptation, Nepal, second	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nepal	2021, Agricultural Transformation Activity, Adaptation, Nepal, third	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2021, Agriculture and Market Support Activity, Adaptation- Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, Agriculture Innovation Mission for Climate Secretariat, Mitigation- Climate Specific	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Global	2021, Agriculture Software Package for Cambodia, Laos, and Nigeria, Adaptation- Climate Specific	0.08	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Asia Regional	2021, Air Quality Community of Practice in Urban Maritime Southeast Asia, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Mexico	2021, Alliance for Sustainable Landscapes and Markets (ASLM), Mitigation	0.9	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowships (STPF), Adaptation	0.067	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowships (STPF), Mitigation	0.067	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Rwanda	2021, Ampersand Rwanda Ltd. and Ampersand E- Mobility Lt, Mitigation	9	Committed	Bilateral	OOF	Concessional loan	Mitigation	Energy
El Salvador	2021, ANADES Funding Extension for Women and Youth in Agriculture Programming in El Salvador, Adaptation- Climate Specific	0.07	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2021, Analyzing the Importance and Impact of Blue Carbon, Adaptation	0.482	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Analyzing the Importance and Impact of Blue Carbon, Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)

Jordan	2021, Aqaba Amman Conveyance, Adaptation	1.35	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Guatemala	2021, Asociación Civil de Pequeños y Medianos Agricultores del Kape (ASOKAPE) Smallholder Farmer Programming in Guatemala, Adaptation	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
El Salvador	2021, Asociación Cooperativa de Producción Agropecuaria de Usulután (ACOPAU) , Adaptation	0.13	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ecuador	2021, Asociación de Desarrollo Agropecuario Familiar de Güel (ADAF-Güel) Agritourism Project in Ecuador, Adaptation	0.16	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Guatemala	2021, Asociación de Mujeres Adelina Caal Maquín (ACM) Community Agriculture Programming in Guatemala, Adaptation- Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, Asociación de Pescadores Artesanales del Caribe Sur (ASOPACS) Fishery Programming, Adaptation	0.17	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
El Salvador	2021, Asociación Instituto Salvadoreño de Educación Cooperativa y Agricultura Orgánica (ISEAC) Sustainable Agriculture Programming in El Salvador, Adaptation- Climate Specific	0.28	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Honduras	2021, Asociación Nacional para el Fomento de la Agricultura Ecológica (ANAFAE) Sustainable Farming Program in Honduras, Adaptation	0.34	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Panama	2021, Asociación Para el Desarrollo Integral Comunitario de Cerro Pelado (ADICO) Community Sustainable Agriculture Support in Panama, Adaptation- Climate Specific	0.09	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Guatemala	2021, Asociación Regional Campesina Ch'ortí (ASORECH) Smallholder Agriculture Support in Guatemala, Adaptation-Climate Specific	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Kenya	2021, Associate Award 2: Strengthening Community Capacities for Resilience and Growth, Adaptation	0.125	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Haiti	2021, Association des Femmes de Denis (AFD) Women Farmer Project in Haiti, Adaptation	0.13	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Haiti	2021, Association des Femmes en Action pour le Développement de Mont-Organisé (AFADMO) Women Community Programming in Haiti, Adaptation	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Haiti	2021, Association des Irrigants de Maury (AIM) Sustainable Agriculture Supoort in Haiti, Adaptation- Climate Specific	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Haiti	2021, Association pour le Développement des Paysans de la Mecette (ADPM) Agriculture Program in Haiti, Adaptation-Climate Specific	0.13	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2021, Bangladesh Advancing Development & Growth through Energy (BADGE), Mitigation	2.919	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2021, Bangladesh Monitoring, Evaluation and Learning (BMEL) Activity, Adaptation	0.021	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2021, Bangladesh Monitoring, Evaluation and Learning (BMEL) Activity, Mitigation, Cross-Cutting	0.033	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Bangladesh	2021, Bangladesh Monitoring, Evaluation and Learning (BMEL) Activity, Mitigation, Other	0.024	Committed	Bilateral	ODA	Grant	Mitigation	Other
Serbia	2021, Better Energy Activity, Mitigation, first	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Serbia	2021, Better Energy Activity, Mitigation, second	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Guatemala	2021, Biodiversity Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Vietnam	2021, Biodiversity Conservation Activity (BCA), Adaptation	1.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Vietnam	2021, Biodiversity Conservation Activity (BCA), Mitigation	2.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Uganda	2021, Biodiversity for Resilience (B4R), Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Uganda	2021, Biodiversity for Resilience (B4R), Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Building a Circular Economy for East Africa, Adaptation	0.175	Committed	Regional	ODA	Grant	Adaptation	Other
Honduras	2021, Building Climate Resilience, Adaptation	0.878	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Somalia	2021, Building Resilient Communities in Somalia (BRCiS), Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Burma	2021, Burma Agriculture Policy Support Activity (MAPSA), Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Burma	2021, Burma Remote Agriculture Monitoring, Mitigation-Climate Specific	1.65	Committed	Bilateral	ODA	Grant	Mitigation	other

Cambodia	2021, Cambodia Green Future Activity (formerly Natural Resource Management), Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2021, Caribbean Climate Investment Program (CCIP), Mitigation, Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, the Bahamas, and Trinidad and Tobago	0.264	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Dominican Republic	2021, Caribbean Climate Investment Program (CCIP), Mitigation, Dominican Republic	1.65	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Latin America & Caribbean Regional	2021, Caribbean Energy Security Initiative, Mitigation, first	2.5	Committed	Regional	ODA	Grant	Mitigation	Energy
Latin America & Caribbean Regional	2021, Caribbean Energy Security Initiative, Mitigation, second	0.5	Committed	Regional	ODA	Grant	Mitigation	Energy
Dominican Republic	2021, Caribbean Participating Agency Program Agreement (PAPA), Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Brazil	2021, Caritas Brasileira Regional do Maranhão (CBMA) Smallholder Agriculture Support in Brazil, Adaptation- Climate Specific	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Kyrgyzstan, Tajikistan, Pakistan	2021, CASA-1000 Secretariat Project, Mitigation	1.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Cambodia	2021, Center of Excellence for Sustainable Agricultural Intensification and Nutrition (CE-SAIN), Adaptation	0.138	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Asia Regional	2021, Central Asia Energy Fellows Program, Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Energy
Honduras	2021, Central de Cajas Rurales de Intibucá (CECRI) Agricultural Markets Program in Honduras, Adaptation	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Peru	2021, Centro de Estudios y Desarrollo Social Apurimac (CEDES-APURIMAC) Smallholder Farmer Programming in Peru, Adaptation	0.34	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Bangladesh	2021, Chittagong Hill Tracts Watershed Co-Management Activity (CHTWCA), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Bangladesh	2021, Chittagong Hill Tracts Watershed Co-Management Activity (CHTWCA), Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	other
India	2021, cKers Finance, Mitigation	2.5	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Energy
Global	2021, Clean Air Catalyst (CAC), Adaptation	0.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Clean Air Catalyst (CAC), Mitigation	0.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Clean EDGE Asia Finance Working Group, Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Global	2021, Clean Energy Investment Accelerator, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Clean Energy Ministerial, Mitigation	3.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Middle East Regional	2021, Climate Action for MENA Adaptation, Adaptation	0.33	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Dominican Republic	2021, Climate Adaptation Program, Adaptation, first	0.9	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Dominican Republic	2021, Climate Adaptation Program, Adaptation, second	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Global	2021, Climate Adaptation Support Activity (CASA), Adaptation	0.225	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Climate Adaptation Support Activity, Adaptation	0.893	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Global	2021, Climate Ambition “SWAT Teams”, Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Climate Change Adaptation through the Development of Native Tree Nurseries, Adaptation, first	0.25	Committed	Regional	ODA	Grant	Adaptation	Forestry
Africa Regional	2021, Climate Change Adaptation through the Development of Native Tree Nurseries, Adaptation, second	0.175	Committed	Regional	ODA	Grant	Adaptation	Forestry
Asia Regional	2021, Climate Ready, Adaptation	2	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2021, Climate Resilient Cities (CRC), Adaptation	1.879	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Philippines	2021, Climate Resilient Cities, Mitigation	0.81	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Iraq	2021, Climate Resilient Infastructure, Stabilization, Mitigation	3.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Coalition for Private Sector Investment in Conservation, Adaptation, first	0.3	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Coalition for Private Sector Investment in Conservation, Adaptation, second	0.175	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Colombia	2021, Colombia Agriculture Community Support, Adaptation- Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, Combating Illegal Logging to Reduce Deforestation, Forest Degradation, and their Associated Emissions, Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Brazil	2021, Comissão Pastoral da Terra do Rio Grande do Norte (CPT-RN) Smallholder Agriculture Initatives in Brazil, Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Honduras	2021, Comité para la Defensa y Desarrollo de la Flora y Fauna del Golfo de Fonseca (CODDEFFAGOLF) Women and Youth Natural Resource Management Project in Honduras, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Haiti	2021, Comité PROTOS Haïti (CPH) Sustainable Agriculture Support in Haiti, Adaptation- Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Colombia	2021, Comprehensive Action for Climate Change (CACCI) - Adaptation Buy-in, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Europe & Eurasia Regional	2021, Connect For Growth (C4G), Mitigation	0.05	Committed	Regional	ODA	Grant	Mitigation	Energy
Global	2021, Conservation and Natural Resource Management Activities, Mitigation	5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Kenya	2021, Conservation Policy Program, Adaptation	0.045	Committed	Bilateral	ODA	Grant	Adaptation	Other
Honduras	2021, Conserving Coastal Ecosystems, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Peru	2021, Cooperativa Agraria Norandino (Norandino), Women INvesting in Growth and Security (WINGS) initiative in Peru, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Dominican Republic	2021, Cooperativa de Productores Orgánicos Valle de Río Limpio (COOPROVALLE) Agricultre program in Domincian Republic, Adaptation	0.18	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Brazil	2021, Cooperativa de Trabalho, Prestação de Serviços, Assistência Técnica e Extensão Rural (COOPTER), Resource Management Support in Brazil, Adaptation	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Nicaragua	2021, Cooperativa Multisectorial de Productores Orgánicos De El Rama R. L. (COMPOR) Agriculture Program in Nicarauga, Adaptation- Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Paraguay	2021, Coordinadora Departamental de Mujeres de San Pedro (CDMSP) Women Smallholder Producers Programming in Paraguay, Adaptation	0.08	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Latin America & Caribbean Regional	2021, COP26 Regional Coordination Assistance, Adaptation	0.08	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2021, Cross Border Resilience Community (CBRC) Activity, Adaptation, first	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2021, Cross Border Resilience Community (CBRC) Activity, Adaptation, second	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2021, Cross Border Resilience Community (CBRC) Activity, Adaptation, third	0.115	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Mexico	2021, Desarrollo Autogestionario, A.C. (AUGE) Food Security Program in Mexico***, Adaptation- Climate Specific	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Colombia	2021, Destination Nature, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Brazil	2021, Diaconia Smallholder Farmer Programming in Brazil, Adaptation	0.31	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Marshall Islands	2021, Disaster Resilience in the Compact Nations (RESILIENCE) activity, Adaptation, Marshall Islands	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Micronesia	2021, Disaster Resilience in the Compact Nations (RESILIENCE) activity, Adaptation, Micronesia	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kenya	2021, Disaster Risk Management Professionalization and Youth Leadership (DRM-PYL), Adaptation	0.03	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Jamaica	2021, Disaster Risk Reduction Activity, Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Global	2021, Diversifying Clean and Resilient Solar Supply Chains, Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Nepal	2021, Dolma Impact Fund II, Mitigation	4	Committed	Bilateral	OOF	Equity	Mitigation	Cross-Cutting
Africa Regional	2021, Drought resillience in IGAD region, Adaptation	0.036	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Early Recovery, Risk Reduction, and Resilience (ER4) Resilience Food Security Activities (RFSAs), Adaptation-Climate Specific	11.742	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Africa Regional	2021, EAST AFRICA MARKET SYSTEMS (EAMS)-former RAMS, Adaptation	0.1	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Ecosystem Restoration and Climate Resilience in East Africa's Transboundary Landscapes, Adaptation	1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Bangladesh	2021, Ecosystems (Protibesh), Adaptation	0.65	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Bangladesh	2021, Ecosystems (Protibesh), Adaptation, first	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Bangladesh	2021, Ecosystems (Protibesh), Mitigation	1.096	Committed	Bilateral	ODA	Grant	Mitigation	Other
Indonesia	2021, Effective Marine Conservation or Konservasi Laut Efektif (Kolektif), Adaptation	0.334	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
India	2021, Electronica Finance Limited, Mitigation	10	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Energy
Bangladesh	2021, Enabling Environment for Climate Resilience Activity, Adaptation	0.428	Committed	Bilateral	ODA	Grant	Adaptation	Other
Africa Regional	2021, Ending AIDS in West Africa (EAWA), Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Iraq	2021, Energy Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Energy Agency Collaborations, Mitigation	3.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Ecuador	2021, Energy Efficiency for Development Programs, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Colombia	2021, Energy for Peace - Providencia Island Support, Mitigation	0.998	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Global	2021, Energy Mineral Supply Chain Mapping, Mitigation	0.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Bosnia and Herzegovina	2021, Energy Policy Activity, Mitigation	0.107	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bosnia and Herzegovina	2021, Energy Policy Activity, Mitigation, first	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Energy Regulatory Partnership Program (ERPP), Mitigation	0.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2021, Energy Sector Reform (ESR) Activity, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Energy
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2021, Energy Sector Reform (ESR) Activity, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Armenia	2021, Energy Secure Armenia, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Philippines	2021, Energy Secure Philippines (ESP), Mitigation	4.696	Committed	Bilateral	ODA	Grant	Mitigation	other
North Macedonia	2021, Energy Security Activities, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
North Macedonia	2021, Energy Security Activities, Mitigation, first	0.615	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Ukraine	2021, Energy Security Project (ESP), Mitigation	9	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Dominican Republic	2021, Energy Storage Regulatory Roadmap Technical Assistance for battery energy storage systems (BESS) in the Dominican Republic, Mitigation	0.62	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Kosovo	2021, Energy Sustainability Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2021, Enhanced Coastal Fisheries (ECOFISH) II Activity, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Cambodia, Indonesia, Laos, Philippines, Vietnam, Thailand	2021, Enhancing Equality in Energy for Southeast Asia (E4SEA), Mitigation	0.66	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Uganda	2021, Enhancing Resilient and Adaptive Livelihoods in Uganda - IITA, Adaptation	1.45	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Mozambique	2021, Environmental Security and Resilience in Northern Mozambique (ECOSMART-2), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Barbados and Eastern Caribbean, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2021, Environmental Support Services Contract (ESSC), Adaptation	0.34	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Barbados and Eastern Caribbean, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2021, Environmental Support Services Contract (ESSC), Mitigation, Cross-Cutting	0.086	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Barbados and Eastern Caribbean, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2021, Environmental Support Services Contract (ESSC), Mitigation, Other	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other

Africa Regional	2021, EPP - Building effective management and sustainable financing for the Okapi Wildlife Reserve through a Public-Private partnership - WCS, Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Philippines	2021, Evidence-Driven Collaborating, Learning, and Adapting (CLAIMDev), Mitigation, Cross-Cutting	0.119	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Expanding Air Quality Communities of Practice in Africa, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Expanding Water, Sanitation and Hygiene (Formerly WASH - GIP), Adaptation	0.111	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Pakistan	2021, Ex-Post Evaluations (Sustainable Energy for Pakistan, Peshawar Electricity Supply Company (PESCO) Pilot Program), Mitigation	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Other
Dominican Republic	2021, Federación de Caficultores y Agricultores para el Desarrollo de San Juan, Inc. (FECADESJ) Agriculture Support in the Dominican Republic, Adaptation- Climate Specific	0.38	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Cambodia	2021, Feed the Future Cambodia Harvest III, Adaptation-Climate Specific	1.911	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Guatemala	2021, Feed the Future Guatemala Innovative Solutions for Agricultural Value Chains (PRO-INNOVA), Adaptation	1.75	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nigeria	2021, Feed the Future Nigeria Agricultural Extension and Advisory Services and Technology Promotion Activity, Adaptation	0.103	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nigeria	2021, Feed the Future Nigeria Rural Resilience Activity, Adaptation	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2021, Feed the Future Policy Systems Services Activity, Adaptation	3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2021, Feed the Future Senegal Cultivating Nutrition (Kawolor), Adaptation	0.695	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2021, Feed the Future Senegal Dekkal Geej, Adaptation	0.721	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2021, Feed the Future Senegal Value Chain Services Activity, Adaptation	0.24	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Feed the Future Zimbabwe-Fostering Agribusiness for Resilient Markets (FTFZ-FARM), Adaptation, West Africa Regional	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting

Zimbabwe	2021, Feed the Future Zimbabwe-Fostering Agribusiness for Resilient Markets (FTFZ-FARM), Adaptation, Zimbabwe	0.475	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Fish and Wildlife Service Interagency Agreement, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Forestry
Global	2021, Fish and Wildlife Service Interagency Agreement, Mitigation	6.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)
Burma	2021, Fish for Livelihoods, Adaptation	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Philippines	2021, Fish Right, Adaptation	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2021, Flagship Caribbean Marine Biodiversity Activity, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname,	2021, Flagship Caribbean Marine Biodiversity Activity, Mitigation	0.05	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)

The Bahamas, and Trinidad and Tobago								
Mexico	2021, Fondo Oaxaqueño para la Conservación de la Naturaleza (FOCN) Community Enviroment Support in Mexico, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Forest Finance Flows Initiative, Mitigation	3.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Colombia	2021, Forest First Colombia S.A.S., Mitigation	22	Committed	Bilateral	OOF	Concessional loan	Mitigation	Forestry
Africa Regional	2021, Forest Resource Management, Mitigation	0.467	Committed	Regional	ODA	Grant	Mitigation	other
Africa Regional	2021, Forestry and Biodiversity Support Activity (FABS), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	other
Bangladesh	2021, FTF Bangladesh Aquaculture and Nutrition Activity, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Mozambique	2021, FTF Integrated Resilience in Nutrition and Agriculture (FFT-RESINA), Adaptation- Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Honduras	2021, Fundación Comunitaria Puca Agroforestry Community Support in Honduras, Adaptation	0.23	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Global	2021, Fundación Coordinadora Latinoamericana y del Caribe de Pequeños Productores y Trabajadores de Comercio Justo (CLAC) COVID19 Recovery Fund for Small Producers, Adaptation	0.39	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Bolivia	2021, Fundación Ecotop (ECOTOP) Sustainable Agriculture Support in Bolivia, Adaptation- Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Argentina	2021, Fundación Gran Chaco (FGCH) Smallholder Farmer Programming in Argentina, Adaptation	0.28	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
El Salvador	2021, Fundación para el Desarrollo Socioeconómico y Restauración Ambiental Gunding Extension in El Salvador, Adaptation	0.24	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Honduras	2021, Fundación para la Investigación Participativa con Agricultores de Honduras (FIPAH) Smallholder Farmer Programming in Honduras, Adaptation	0.26	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Panama	2021, Fundación Rapaces y Bosques - Panamá (FRBP) Sustainable Agriculture Project in Panama, Adaptation-Climate Specific	0.28	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Colombia	2021, GDA Energy Transtion for PDETs, Mitigation	4.5	Committed	Bilateral	ODA	Grant	Mitigation	other
Colombia	2021, GDAs, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Other
Laos, Thailand	2021, Gender Equity and Equality Fund (GEEA), Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, GenDev - Advancing Gender in the Environment (AGENT), Adaptation	3.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, GENDEV: Climate Gender Equity Fund (CGEF) , Adaptation	4.2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, GENDEV: Gender Lens Investing and Energy Financing for Women, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Niger	2021, GENDEV: People-to-People Reconciliation Fund APS--Niger, Gender Inequality and Climate-Conflict Nexus, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2021, GENDEV: Women Empowered as Clean Air Catalysts, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2021, GENDEV: Women’s Land Rights through Integrated Land and Resource Governance (ILRG) and ACE , Adaptation	1.25	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Kenya	2021, GENDEV:Gender Equity and Women’s Empowerment for Climate Action in Kenya, Adaptation	3.8	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Peru	2021, GENDEV:Gender-Responsive Climate Action with Peru, Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2021, Geological Survey IAA, Mitigation	0.516	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Tajikistan	2021, Global Development Alliance (GDA) with Pamir Energy (PE), Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Global Forest Watch 3.0, Mitigation	0.35	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Global	2021, Global Methane Initiative, Mitigation	1.22	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2021, Global Power System Transformation Consortium (G-PST), Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Green Recovery Investment Platform (GRIP) - Climate Finance, Adaptation	1.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Energy

Global	2021, Green Recovery Investment Platform (GRIP) - Climate Finance, Mitigation, Cross-cutting	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2021, Green Recovery Investment Platform (GRIP) - Climate Finance, Mitigation, Energy	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Cambodia	2021, Greening Prey Lang, Adaptation	0.072	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Cambodia	2021, Greening Prey Lang, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Cambodia	2021, Greening Prey Lang, Mitigation, first	1.923	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Europe & Eurasia Regional	2021, Greenland: Economic Empowerment and Tourism, Mitigation	0.65	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Kenya	2021, Ground Water Exploration and Assessment, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Guatemala	2021, Guatemala solar, Mitigation	8.71	Committed	Bilateral	OOF	Export credit	Mitigation	Energy
Guatemala	2021, Guatemalan Entrepreneurship and Development Innovation (GEDI), Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Ecuador	2021, Guayaquil Airport Sustainability Plan Technical Assistance, Mitigation	0.85	Committed	Bilateral	ODA	Grant	Mitigation	Transport
Haiti	2021, Haiti Resilience and Agriculture Sector Advancement (HRASA), Adaptation- Climate Specific	3.7	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2021, Health, Ecosystems and Agriculture for Resilient, Thriving Societies Global development Alliance (HEARTH GDA), Mitigation - Climate Specific- Climate Specific	0.1	Committed	Regional	ODA	Grant	Mitigation	other
Tanzania	2021, Heshimu Bahari (“We Respect the Ocean”), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Guatemala	2021, Hurricane Response Grants in Guatemala, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2021, ID - Disability Program funds allowed to missions through field allowances, Adaptation	6.22	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Lebanon	2021, IDEAS - Renewable Energy, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh, Maldives, Nepal	2021, Inclusive Action for Climate Change, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Somalia	2021, Inclusive Resilience in Somalia (IRiS), Adaptation	2.665	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Global	2021, Incubating Blended Finance Vehicles for Adaptation, Adaptation	2.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Colombia	2021, Indigenous Peoples and Afro-Colombian Empowerment Activity, Adaptation	1.242	Committed	Bilateral	ODA	Grant	Adaptation	Other
Bolivia	2021, Indigenous Producers Support Project in Bolivia, Adaptation	0.08	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Asia Regional	2021, Indonesia MEL Platform, Adaptation	0.03	Committed	Regional	ODA	Grant	Adaptation	Other
Indonesia	2021, Indonesia MEL Platform, Mitigation	0.138	Committed	Bilateral	ODA	Grant	Mitigation	Other
Indonesia	2021, Indonesia MEL Platform, Mitigation, second	0.243	Committed	Bilateral	ODA	Grant	Mitigation	Other
Indonesia	2021, Indonesia Municipal Solid Waste Management (SELARAS), Adaptation	0.506	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Indonesia	2021, Indonesia Urban Resilient Water, Sanitation and Hygiene (IUWASH Tangguh), Adaptation	1.42	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Indonesia	2021, Indonesia Urban WASH Market (IUWASH Pasar), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Indonesia	2021, Indonesia, Adaptation	0.72	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2021, Institutional Support Contract - Climate (TOPS), Adaptation	0.164	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Institutional Support Contract - Climate (TOPS), Mitigation	0.16	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Nicaragua	2021, Instituto de Investigación y Desarrollo Nitlapan de la Universidad Centroamericana (NITLAPAN-UCA) Community Programming in Nicaragua, Adaptation	0.18	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Honduras	2021, Instituto para la Cooperación y Autodesarrollo (ICADE) Community Programming in Honduras, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2021, Integrated Community Agriculture and Nutrition (ICAN), Adaptation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, Integrated Land and Resource Governance II (ILRG II), Mitigation	0.15	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, Integrated Natural Resource Management (INRM), Mitigation	0.55	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, Integrated Natural Resource Management (INRM), Mitigation, second	1.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting

Africa Regional	2021, Integrated Natural Resources Management (INRM) FEWS NET Health Threat Extension Activity - Adaptation - Climate Specific	0.239	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Senegal	2021, Integrated WASH activity, Mitigation	0.873	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Bangladesh	2021, Integrated Youth Activity, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, International Carbon Credits Console, Mitigation	0.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, International Carbon Credits Console, Mitigation, first	1.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, International Energy Agency's Clean Energy Transitions Programme, Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Antigua and Barbuda, Barbados, The Bahamas, Dominica, Grenada, Guyana, Saint Lucia, St. Kitts and Nevis, St. Vincent and The Grenadines, Suriname and Trinidad and Tobago	2021, INVEST/Transaction Advisory Services, Adaptation	0.325	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Europe & Eurasia Regional	2021, Investments to Develop Energy Assets (IDEA), Mitigation	0.1	Committed	Regional	ODA	Grant	Mitigation	Energy
Europe & Eurasia Regional	2021, Investments to Develop Energy Assets (IDEA), Mitigation, first	1.45	Committed	Regional	ODA	Grant	Mitigation	Energy
Iraq	2021, Iraq Governance Performance and Accountability Project (IGPA), Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2021, IRRI Rice Breeding Public-Private Partnership Platform Activity, Mitigation	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Jordan	2021, Jordan Atomic Energy Agency Report Adaptation	0.13	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Colombia	2021, Junta de Acción Comunal Vereda Cumbarco (JAC Cumbarco) Community Programming in Colombia, Adaptation	0.11	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Europe & Eurasia Regional	2021, Just and Secure Energy Transition (J-SET) (formerly REMI), Mitigation	1.5	Committed	Regional	ODA	Grant	Mitigation	Energy

Europe & Eurasia Regional	2021, Just and Secure Energy Transition (JSET) , Mitigation	0.1	Committed	Regional	ODA	Grant	Mitigation	Energy
Nepal	2021, Karnali Water Activity - WASH, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Nepal	2021, Kathmandu Valley Clean Air Program (KCAP), Mitigation	0.025	Committed	Bilateral	ODA	Grant	Mitigation	Other
Colombia	2021, Land for Prosperity, Mitigation	1.486	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Indonesia	2021, Landscape Approach to Sustainable and Climate Change Resilient Cocoa and Coffee Agroforestry (LASCARCOCO), Adaptation	0.125	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Indonesia	2021, Landscape Approach to Sustainable and Climate Change Resilient Cocoa and Coffee Agroforestry (LASCARCOCO), Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	other
Laos	2021, Laos Energy Security Project, Mitigation	2.6	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Nepal	2021, Lentil Strengthening Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, LIFE-AR, Adaptation	3.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Haiti	2021, Livestock Development Initiative, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, Local Climate Action Grants Program, Mitigation, Cross-Cutting	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, Local Climate Action Grants Program, Mitigation, Energy	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Local2030 Islands Network, Adaptation	4.6	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Dominican Republic	2021, Locally-Led Water Security in the Dominican Republic and Haiti Border Region Program, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Tanzania	2021, Maji na Usafi wa Mazingira (MUM), Adaptation	1.348	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Latin America & Caribbean Regional	2021, Mandatory Ex-Post Evaluation of Completed Clean Energy Program, Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Energy
Mozambique	2021, MIKAJY, Adaptation	1.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, MIKAJY, Reducing threats to targeted protected areas and High Biodiversity Value (HBV), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Other (Health)

Global	2021, Mission Innovation, Mitigation	3.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2021, Mission Program Support, Adaptation	0.152	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2021, Mission Program Support, Mitigation, Cross-Cutting	0.249	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Bangladesh	2021, Mission Program Support, Mitigation, Other	0.18	Committed	Bilateral	ODA	Grant	Mitigation	Other
Paraguay	2021, Mitigation Activity - Interagency Agreement Buy-In, Mitigation	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Other
Peru	2021, Mitigation Peru Activity, Mitigation	2.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Mexico	2021, Mitigation Ventures Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2021, MOMENTUM Routine Immunization Transformation and Equity's (MRITE), Adaptation - Climate Specific	1.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Mongolia	2021, Mongolia Energy Governance (MEG), Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Cambodia	2021, Morodok Baitang, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Cambodia	2021, Morodok Baitang, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Cambodia	2021, Morodok Baitang, Mitigation, first	1.585	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2021, Multilateral Affairs Division Climate Initatives, Adaptation	0.35	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2021, Multilateral Affairs Division Climate Initatives, Mitigation	0.35	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2021, Multinational Species Conservation Fund, Mitigation	8.096	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
India	2021, National Investment and Infrastructure Master Fund (NIIF), Mitigation	9.15	Committed	Bilateral	OOF	Equity	Mitigation	Cross-cutting
Global	2021, National Lab Net-Zero Transition Initiative, Mitigation	2.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, National Oil Company (NOC) Energy Transition, Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Colombia	2021, National Renewable Energy Lab (NREL), Mitigation	0.702	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Mexico	2021, National Renewable Energy Lab Field Support, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Colombia	2021, Nature Based Solutions, Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Colombia	2021, Nature Based Solutions, Adaptation, first	2.758	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2021, Nature Programming and Youth Engagement, Adaptation	0.05	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Argentina, Aruba, Bahamas, Belize, Bonaire, Canada, Chile, Columbia, Curacao, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, St. Eustatius, St. Maarten, Saba, Suriname, United States, Venezuela	2021, Neotropical Migratory Bird Conservation Act Grants, Mitigation	3.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Nithio FI B.V., Mitigation	10	Committed	Regional	OOF	Concessional loan	Mitigation	Cross-cutting
Peru	2021, NIWS Phase II, Adaptation	1.8	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Eastern Caribbean	2021, North Leeward Rabbit Breeders Cooperative (NLRBC) Community Resilience Project in Eastern Caribbean, Adaptation	0.09	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2021, Observing Ocean Warming-Argo Project, Adaptation	3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Observing Ocean Warming-Argo Project, Adaptation, first	11.4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Ocean Risk and Resilience Action Alliance, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Paraguay	2021, Oñoir Sustainable Farming Project in Paraguay, Adaptation	0.08	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Haiti	2021, Organisation de Développement Durable et Solidaire D'Haïti (ODDSHA) Smallholder Agriculture Support in Haiti, Adaptation- Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Haiti	2021, Organisation de Développement Durable et Solidaire D'Haïti (ODDSHA)Funding Related to the Aug 14, 2021 Earthquake in Haiti , Adaptation	0.08	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Haiti	2021, Organisation des Paysans de Labiche (OPLA) Farmer Support in Haiti***, Adaptation	0.19	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Honduras	2021, Organización para el Desarrollo de Corquín (ODECO-Corquín) Agriculture Program in Honduras, Adaptation-Climate Specific	0.29	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Asia Regional	2021, Our Fish Our Future, Adaptation	0.15	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Asia Regional	2021, Pacific American Fund, Adaptation	0.448	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Pacific Monitoring, Evaluation, and Learning activity, Adaptation,	0.475	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Pacific Monitoring, Evaluation, and Learning activity, Adaptation, Pacific Island countries	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Pacific Monitoring, Evaluation, and Learning activity, Mitigation, Cross-Cutting	0.125	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Pacific Monitoring, Evaluation, and Learning activity, Mitigation, Other	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Other
Papua New Guinea	2021, Papua Guinea Electrification Partnership, Mitigation	2.02	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Colombia	2021, Paramos and Forest, Mitigation	3.239	Committed	Bilateral	ODA	Grant	Mitigation	other
Africa Regional	2021, Parliament Support Program (PSP), Adaptation	0.075	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Participating Agency Program Agreement (PAPA) 2021-2026, Adaptation	0.25	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Forestry
Global	2021, Participating Agency Program Agreement (PAPA) 2021-2026, Mitigation	6.45	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry

Mexico	2021, Partnership for Net Zero Cities (PNZC), Mitigation	4.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Somalia	2021, People Centered Governance Activity, Adaptation	0.696	Committed	Bilateral	ODA	Grant	Adaptation	Other
Haiti	2021, Platfòm Inite Òganizasyon Dezam (PLAIOD) Smallholder Agriculture Support in Haiti, Adaptation- Climate Specific	0.19	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2021, PMI Vector Control Central Mechanism, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Africa Regional	2021, POWER AFRICA OFF-GRID PROGRAM (PAOP), Mitigation	1.136	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: African Legal Support Facility II (ALSF II), Mitigation	0.82	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: East Africa Energy Program (EAEP) IDIQ, Mitigation	4.553	Committed	Regional	ODA	Grant	Mitigation	other
Africa Regional	2021, Power Africa: International Finance Corporation (IFC) Public International Organization (PIO) Scaling Solar, Mitigation	0.82	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: Senior Advisors Group II (SAG), Mitigation	1.208	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: Southern Africa Energy Program (SAEP), Mitigation	6.5	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: U.S. African Development Foundation (USADF), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: U.S. International Development Finance Corporation (DFC), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: U.S. Trade and Development Agency (USTDA), Mitigation	0.4	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: Unlocking Southern Africa Solar (USAS) - Mega Solar, Mitigation	0.76	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: West Africa Energy Program (WAEP) IDIQ, Mitigation	11.309	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: African Development Bank's Sustainable Energy Fund for Africa (SEFA), Mitigation	1.451	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: Commercial Law Development Program (CLDP), Mitigation	0.6	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Power Africa: Empower Southern Africa (ESA), Mitigation	4.437	Committed	Regional	ODA	Grant	Mitigation	Energy

Africa Regional	2021, Power Africa: Nigeria Power Sector Program (NPSP), Mitigation	8.195	Committed	Regional	ODA	Grant	Mitigation	Energy
Kazakhstan	2021, Power Central Asia, Mitigation	0.41	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Pakistan	2021, Power Sector Improvement Activity (PSIA), Mitigation	3.46	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Burma	2021, Program Administrative and Oversight, Mitigation	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2021, Program for Local and Urban Sustainability (PLUS), Adaptation	0.76	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Program for Local and Urban Sustainability (PLUS), Adaptation, first	1.05	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2021, Program for Local and Urban Sustainability (PLUS), Mitigation	0.1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Program Funded Staff - Pacific Islands, Mitigation, Cross-Cutting	0.355	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Program Funded Staff - Pacific Islands, Mitigation, Other	0.709	Committed	Bilateral	ODA	Grant	Mitigation	Other
Georgia	2021, Program Support for DO 1, Mitigation	0.226	Committed	Bilateral	ODA	Grant	Mitigation	Other
Honduras	2021, Programa de Reconstrucción Rural (PRR) in Honduras, Adaptation	0.07	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Haiti	2021, Project Paysages Résilients - Nord, Mitigation	2.92	Committed	Bilateral	ODA	Grant	Mitigation	Other
Haiti	2021, Project Paysages Résilients - Sud, Mitigation	1.3	Committed	Bilateral	ODA	Grant	Mitigation	Other
Haiti	2021, Projet Paysages Résilients - Sud, Adaptation	1.1	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Guatemala	2021, Prosperous and Resilient Landscapes, Mitigation	4.796	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Bolivia	2021, Protección del Medio Ambiente Tarija (PROMETA) Smallholder Agriculture Support Program in Belize, Adaptation- Climate Specific	0.12	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Honduras	2021, Protección Hondureña del Medio Ambiente (PROHMEDA) Food Security Project in Honduras, Adaptation-Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Guatemala	2021, Puentes Project, Mitigation	0.488	Committed	Bilateral	ODA	Grant	Mitigation	Energy
India	2021, Punjab Renewable Energy Systems, Mitigation	10	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Energy
Haiti	2021, Reforestation Project, Adaptation	3.735	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Haiti	2021, Reforestation Project, Mitigation	0.445	Committed	Bilateral	ODA	Grant	Mitigation	other

Global	2021, Regional Agriculture Webinars, Adaptation- Climate Specific	0.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
El Salvador, Guatemala, Honduras	2021, Regional Coastal Biodiversity Activity, Adaptation	0.394	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
El Salvador, Guatemala, Honduras	2021, Regional Coastal Biodiversity Activity, Adaptation, first	1.275	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
El Salvador, Guatemala, Honduras	2021, Regional Coastal Biodiversity Activity, Mitigation	0.394	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2021, Regional Energy Sector Reform Activity, Mitigation	4.38	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Senegal	2021, Renewable Energy Activity, Mitigation	1.4	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2021, Renewable energy exports , Mitigation	2.4	Committed	Multi-Bilateral	OOF	Export credit	Mitigation	Energy
Africa Regional	2021, Republic of Congo Conservation Enterprise Activity, Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Republic Of Palau, Federated States Of	2021, Republic of the Marshall Islands and the Republic of Palau Community Resillience, Adaptation	0.81	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Micronesia, Republic Of The Marshall Islands								
Global	2021, Resilience Adaptation Mainstreaming Program (RAMP), Adaptation	4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Kenya	2021, Resilience in Pastoral Areas- North, Adaptation	2.445	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Kenya	2021, Resilience in Pastoral Areas- South, Adaptation	2.555	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Latin America & Caribbean Regional	2021, Resilience Initiative, Adaptation	2.7	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Zimbabwe	2021, Resilience Through Accelerating Community-Based Holistic Outcomes for Resource Sustainability, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Zimbabwe	2021, Resilience Through Accelerating Community-Based Holistic Outcomes for Resource Sustainability, Adaptation, first	0.75	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2021, Resilient Coastal Communities, Adaptation	1	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Mozambique	2021, Resilient Coastal Communities, Adaptation, Mozambique	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Mozambique	2021, Resilient Gorongosa, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2021, Resilient Waters Program, Adaptation	1	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, Restoring Fisheries for Sustainable Livelihoods in Lake Malawi (REFRESH), Adaptation	0.269	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Uganda	2021, Res-WASH Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Africa Regional	2021, Revenue for Growth (Formerly ReMEG), Mitigation	0.05	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Guatemala	2021, Organización para el Desarrollo Integral de Guatemala, Sembrando Esperanza ONG (ODIGUA) Community and Youth Development Projects in Guatemala, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Moldova	2021, Rural Competitiveness and Resilience Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Philippines	2021, Safe Water, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Philippines	2021, Safe Water, Mitigation	0.447	Committed	Bilateral	ODA	Grant	Mitigation	other
Africa Regional	2021, Sahel Collaboration and Communications (SCC), Adaptation	0.037	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Colombia	2021, SAR/Fire PAPA, Mitigation	1.66	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Belize	2021, Sarteneja Alliance for Conservation and Development (SACD) in Belize, Adaptation	0.26	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Kenya	2021, Scaling Sustainability and Resilience of Community Conservancies in Northern Rangelands and Coastal Ecosytsems of Kenya, Adaptation	0.085	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2021, Scaling Up Renewable Energy (SURE) II Task Order, Mitigation	0.345	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Iraq	2021, Scatec Iraq Solar PV, Mitigation	0.98	Committed	Bilateral	OOF	Grant	Mitigation	Energy
Peru	2021, Securing a Sustainable, Inclusive & Profitable Forest Sector (Pro-Bosques), Adaptation	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Peru	2021, Securing a Sustainable, Inclusive & Profitable Forest Sector (Pro-Bosques), Mitigation	3.5	Committed	Bilateral	ODA	Grant	Mitigation	other
Georgia	2021, Securing Georgia’s Energy Future Program, Mitigation	2.274	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Sene Yiriwa Mopti/Timbucktu Agr Prod Sustainable Intensification of Target Value Chain, Adaptation	1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Senegal	2021, Senegal Loan Portfolio Guaranty, Adaptation	10	Committed	Bilateral	OOF	Loan guarantee	Adaptation	Energy

Senegal	2021, Senegal solar, Adaptation	0.35	Committed	Bilateral	OOF	Export credit	Adaptation	Energy
Global	2021, SilvaCarbon activity, Mitigation	0.666	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2021, SilvaCarbon, Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
West Bank and Gaza	2021, Small and Medium Enterprise Assistance for Recovery and Transition (SMART), Adaptation	0.62	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Fiji, Samoa, Tonga, and Vanuatu	2021, Small Project Assistance (SPA), Adaptation	0.07	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Nigeria	2021, Small Town WASH, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Brazil	2021, Smart Grid Regulatory Roadmap Technical Assistance for the Brazilian Association of Electricity Distributors, Mitigation	0.61	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Algeria	2021, Société Algérienne de Gestion du Réseau de Transport de l'Electricité (GRTE) Funding in Algeria, Mitigation	0.59	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Asia Regional	2021, South Asia Group for Energy (SAGE) - Phase 2, Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2021, South Asia Regional Energy Partnership (SAREP), Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2021, Spark+ Africa Fund, Mitigation	10	Committed	Regional	OOF	Concessional loan	Mitigation	Energy
Philippines	2021, Strategic Actions to Value and Enhance (SAVE) Biodiversity, Adaptation	0.65	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2021, Strategic Actions to Value and Enhance (SAVE) Biodiversity, Mitigation	0.4	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Architecture and Engineering (A&E), Adaptation- Climate Specific	0.764	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
India	2021, Strengthening Landscape Management and Conservation, Adaptation	2.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Asia Regional	2021, Strengthening Landscape Management and Conservation, Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Tajikistan	2021, Strengthening Natural Resource Management Capacity in Tajikistan (PAPA), Adaptation	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Forestry

Tajikistan	2021, Strengthening Natural Resource Management Capacity in Tajikistan (PAPA), Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Strengthening Natural Resources Safeguards in Asia, Adaptation	0.375	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2021, Strengthening Natural Resources Safeguards in Asia, Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Colombia	2021, STTA Support (Illegal Mining), Mitigation	0.075	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Jordan	2021, Sunfinder Solar Energy Transformation Fund, Mitigation	2	Committed	Bilateral	OOF	Insurance	Mitigation	Energy
Egypt	2021, Support Government of Egypt climate change adaptation priorities, Adaptation	2.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Kenya	2021, Support to Government of Kenya, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Eastern Caribbean	2021, Supporting Women Farmers in Antigua and Bardbuda, Adaptation	0.13	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ecuador	2021, Sustainable Activities for Conservation of a Healthy Amazon (SACHA), Mitigation - Climate Specific	2.796	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Colombia	2021, Sustainable Agriculture, Adaptation- Climate Specific	3.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Colombia	2021, Sustainable Agriculture, Mitigation- Climate Specific	1.101	Committed	Bilateral	ODA	Grant	Mitigation	other
Colombia	2021, Sustainable Agriculture, Mitigation, second- Climate Specific	1.641	Committed	Bilateral	ODA	Grant	Mitigation	other
Indonesia	2021, Sustainable Environmental Governance Across Regions - SEGAR, Mitigation	3.807	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Vietnam	2021, Sustainable Forest Management (SFM), Adaptation	1.869	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Vietnam	2021, Sustainable Forest Management (SFM), Mitigation	4.144	Committed	Bilateral	ODA	Grant	Mitigation	other
Eastern Caribbean	2021, Sustainable Grenadines Program in Eastern Caribbean, Adaptation	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Philippines	2021, Sustainable Interventions for Biodiversity, Oceans, and Landscapes (SIBOL), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2021, Sustainable Interventions for Biodiversity, Oceans, and Landscapes (SIBOL), Mitigation	1.2	Committed	Bilateral	ODA	Grant	Mitigation	other
Kenya	2021, Sustainable management of Tsavo and Amboseli landscapes for resilient communities and ecosystems, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other
Mexico	2021, Sustainable Management of Community Lands II, Mitigation	1.45	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting

Peru	2021, Sustainable Management of Forest Concessions, Mitigation	1.056	Committed	Bilateral	ODA	Grant	Mitigation	other
Mexico	2021, Sustainable Prosperous Communities (SPC), Mitigation	2.583	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2021, Sustainable Shea Initiative, Adaptation	0.25	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Kenya	2021, Sustainable, Transformational and Accessible Water Interventions (STAWI) Activity, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Senegal	2021, Taiba Wind Farm Expansion, Mitigation	0.59	Committed	Bilateral	OOF	Grant	Mitigation	Energy
Asia Regional	2021, Task Force on Nature-Related Financial Disclosures, Adaptation	0.048	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Task Force on Nature-Related Financial Disclosures, Mitigation, Cross-Cutting	0.042	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Task Force on Nature-Related Financial Disclosures, Mitigation, Other	0.05	Committed	Regional	ODA	Grant	Mitigation	Other
Nepal	2021, Tayar Nepal - Improved Disaster Risk Management Project, Adaptation	1.7	Committed	Bilateral	ODA	Grant	Adaptation	Other
Brazil	2021, Technical Assistance for Brazil's National Association of Passenger Rail Operators , Mitigation	0.85	Committed	Bilateral	ODA	Grant	Mitigation	Transport
Africa Regional	2021, TerresEauVie (TEV), Adaptation,	0.569	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Niger	2021, TerresEauVie (TEV), Adaptation, Niger	0.532	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2021, TerresEauVie, Adaptation	0.942	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2021, TerresEauVie, Adaptation, first	1.75	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Brazil, Peru, Colombia, Ecuador	2021, The Business Case for Collective Landscape Action, Mitigation	0.6	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Industry
Eastern Caribbean	2021, The Centre for Livelihoods, Ecosystems, Energy, Adaptation, and Resilience in the Caribbean (CLEAR) Coral Reef Restoration Initatives in Eastern Caribbean, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Africa Regional	2021, The Eastern Kafue Alliance for Nature and Prosperity - Health, Ecosystems and Agriculture for Resilient, Thriving Societies (HEARTH), Adaptation, - Climate Specific	0.65	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting

Africa Regional	2021, The Eastern Kafue Alliance for Nature and Prosperity - Health, Ecosystems and Agriculture for Resilient, Thriving Societies (HEARTH), Adaptation, East Africa Regional- Climate Specific	0.181	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, The Luangwa Protecting Nature Improving Lives - Health, Ecosystems and Agriculture for Resilient, Thriving Societies (HEARTH) Global Development Alliance, Mitigation-Climate Specific	0.83	Committed	Regional	ODA	Grant	Mitigation	other
Belize	2021, The Nature Conservancy, Adaptation	425	Committed	Bilateral	OOF	Insurance	Adaptation	Other (Fisheries, Marine, and Coastal)
Georgia	2021, The Resilient Communities Program, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2021, The Shade-grown Cocoa Activity, Mitigation	0.733	Committed	Regional	ODA	Grant	Mitigation	Agriculture
Nepal	2021, Trade and Competitiveness Activity - Udhyam, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ghana	2021, Trade and Investment Activity, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Asia Regional	2021, Trees Outside Forests in India, Mitigation	2.7	Committed	Regional	ODA	Grant	Mitigation	other
Global	2021, Trine AB, Mitigation	10	Committed	Multi-Bilateral	OOF	Loan guarantee	Mitigation	Energy
Global	2021, Tropical Forest and Coral Reef Conservation Act (TFCCA), Adaptation	15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Tanzania	2021, Tuhifadhi Maliasili (“Preserve Natural Resources”), Adaptation	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2021, Tuhifadhi Maliasili (“Preserve Natural Resources”), Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Indonesia	2021, U.S. Departments partnership, Mitigation	0.125	Committed	Bilateral	ODA	Grant	Mitigation	Other
India	2021, U.S.-India Climate and Clean Energy Agenda 2030 Partnership, Mitigation	2.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy

India	2021, UC Inclusive Credit Private Limited, Mitigation	8.33	Committed	Bilateral	OOF	Concessional loan	Mitigation	Cross-cutting
El Salvador, Guatemala, Honduras	2021, Upper Lempa Watershed Project, Adaptation	1.725	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Urban Resilience Program, Adaptation	0.025	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2021, Urban Resilience Program, Mitigation, Cross-Cutting	0.025	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2021, Urban Resilience Program, Mitigation, Other	0.025	Committed	Regional	ODA	Grant	Mitigation	Other
Nepal	2021, Urja Nepal, Mitigation	2.669	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Tanzania	2021, Usimamizi Endelevu Wa Maliasili (“Resilient Natural Resources Governance”), Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2021, Usimamizi Endelevu Wa Maliasili (“Resilient Natural Resources Governance”), Mitigation	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Uzbekistan	2021, UzHydromet program, Adaptation	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Vietnam	2021, Vietnam Low Emission Energy Program (VLEEP II), Mitigation	3.737	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kazakhstan, Turkmenistan, Tajikistan, Kyrgyzstan, Uzbekistan	2021, Water and Vulnerable Environment, Adaptation	3.8	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2021, Water and Wastewater Virtual Reverse Trade Mission Series, Adaptation	0.06	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Jordan	2021, Water Governance Activity, Adaptation	1.3	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Senegal	2021, Water Management Activity, Adaptation	0.555	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Lebanon	2021, Water Sanitation and Conservation (WSC) Activity, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Africa Regional	2021, Water, Sanitation and Hygiene Finance (WASH-FIN) 2.0 Activity, Adaptation	1.05	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Nigeria	2021, Watershed Management for Source Water Protection - NPI, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2021, West Africa Biodiversity and Low Emissions Development (WABiLED), Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting

Global	2021, West Africa Power Pool, Mitigation	1.48	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Nigeria	2021, West Africa Trade and Investment Hub Activity, Adaptation	0.372	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Argentina, Belize, Chile, Colombia, Costa Rica, Guatemala, Honduras, Mexico, Panama, Peru and Paraguay	2021, Western Hemisphere Program Conservation Action, Mitigation	6.24	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Niger	2021, Yalwa food security in face of climate change activity , Adaptation- Climate Specific	2.635	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2021, Yalwa, Adaptation	0.3	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Zambia	2021, Zambia Agricultural Diversification Support, Adaptation	0.085	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Zambia	2021, Zambia Integrated HIV and Health Activity, Adaptation - Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Indonesia	2022, Indonesia Activity, Mitigation	3.5	Committed	Bilateral	ODA	Grant	Mitigation	Other
Asia Regional	2022, "Lukautim Graun" (Look after the environment), Adaptation	0.7	Committed	Regional	ODA	Grant	Adaptation	Forestry
Papua New Guinea	2022, "Lukautim Graun" (Look after the environment), Papua New Guinea, Adaptation, Adaptation	2.8	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Papua New Guinea	2022, "Lukautim Graun" (Look after the environment), Papua New Guinea, Mitigation, Mitigation	3	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Bangladesh	2022, “One Health” GHSA Systems Strengthening Activity, Adaptation - Climate Specific	1.125	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Jordan	2022, AAWDCP Procurement Support Contract (Aqaba Amman Conveyance), first, Adaptation	3	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Jordan	2022, AAWDCP Procurement Support Contract (Aqaba Amman Conveyance), second, Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Zambia	2022, Absa Bank Zambia PLC, Mitigation	1.67	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Cross-cutting
Bangladesh	2022, Accelerating Gender Equality and Women and Girls’ Empowerment in Bangladesh (AGEWEB), Adaptation, Adaptation	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Bangladesh	2022, Accelerating Gender Equality and Women and Girls' Empowerment in Bangladesh (AGEWEB), Mitigation, Mitigation	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Ghana	2022, Accelerating Social and Behavior Change (ASBC) Award, Adaptation	0.68	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Act to End Neglected Tropical Diseases | East, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Act to End Neglected Tropical Diseases | West, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Jordan	2022, Activity for Furnishing and Equipping Health Facilities, Adaptation - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Trinidad and Tobago, Colombia, El Salvador, Peru	2022, Adaptation Activity - Green Cities Buy-In, Adaptation, Trinidad and Tobago, Colombia, El Salvador, Peru, Adaptation	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Trinidad and Tobago, Colombia, El Salvador, Peru	2022, Adaptation Activity - Green Cities Buy-In, Trinidad and Tobago, Colombia, El Salvador, Peru, second, Adaptation	0.405	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Colombia, Trinidad and Tobago, El Salvador	2022, Adaptation Activity - Green Cities Buy-In, Trinidad and Tobago, Colombia, El Salvador, Peru, third, Adaptation	0.4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Indonesia	2022, Adaptation Program, Indonesia, Adaptation	6.345	Committed	Bilateral	ODA	Grant	Adaptation	Other
Yemen	2022, Addressing WASH Services in Yemen, Adaptation	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Indonesia	2022, ADM Capital Sustainable Landscape, Mitigation	100	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Cross-cutting
Global	2022, Advanced Technologies for Methane Abatement Reverse Trade Mission (RTM) Series, Mitigation	1.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Advancing Capacity for the Environment (ACE), Adaptation	0.75	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Advancing Capacity for the Environment (ACE), Mitigation, Cross-Cutting	1.246	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Advancing Capacity for the Environment (ACE), Mitigation, Other	1.111	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Indonesia	2022, Advancing Gender in the Environment (AGENT), Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Other

Global	2022, Advancing Modern Power through Utility Partnerships (AmpUp), Mitigation, first	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Advancing Modern Power through Utility Partnerships (AmpUp), Mitigation, first, second	0.75	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Asia Regional	2022, Advancing Nature-based Solutions to Address Climate Change under the Locally Led Development APS, Mitigation	2	Committed	Regional	ODA	Grant	Mitigation	Forestry
Kyrgyz Republic	2022, Advancing Nutrition in Kyrgyzstan, Adaptation	0.7	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Advancing Nutrition, Adaptation, Agriculture- Climate Specific	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Niger	2022, Advancing Nutrition, Adaptation, Niger	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Advancing Nutrition, Adaptation, Other	0.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, AF Disaster Risk Finance (ARC/ADRiFi), Adaptation	24	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, AfDB Africa Climate Change Fund methane, Mitigation, Cross-Cutting	2.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, AfDB Africa Climate Change Fund methane, Mitigation, Energy	2.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Africa Adaptation Initiative (AAI), Adaptation	25	Committed	Regional	OOF	Equity	Adaptation	Cross-cutting
Global	2022, Africa Adaptation Initiative, Adaptation	25	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Africa Renewable Energy Fund II (AREF II), Mitigation	40	Committed	Regional	OOF	Equity	Mitigation	Energy
Africa Regional	2022, Africa Trade and Investment (ATI) Climate Finance for Low-Emissions Agriculture Activity, Adaptation- Climate Specific	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Africa Trade and Investment (ATI) Climate Finance for Low-Emissions Agriculture activity, Mitigation- Climate Specific	0.89	Committed	Regional	ODA	Grant	Mitigation	Agriculture
Africa Regional	2022, Africa Trade and Investment, Mitigation	0.4	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Africa Regional	2022, African Conservation and Tourism Fund, Mitigation	0.01	Committed	Regional	ODA	Grant	Mitigation	Forestry
Tanzania	2022, Afya Endelevu, Mitigation	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Other

Tanzania	2022, Afya Shirikishi “Participatory Health”, Mitigation - Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Kenya	2022, Afya UGAVI: Procurement and Supply Management Technical Assistance, Adaptation	0.011	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2022, Afya Yangu - RMNCAH, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2022, Afya Yangu - RMNCAH, Mitigation	0.7	Committed	Bilateral	ODA	Grant	Mitigation	Other
Tanzania	2022, Afya Yangu North/Central, Mitigation	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uzbekistan	2022, Agribusiness Development Activity, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nepal	2022, Agricultural Inputs, Adaptation	1.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ethiopia	2022, Agriculture and Food System Transformation, Adaptation- Climate Specific	3.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Lebanon	2022, Agriculture and Rural Empowerment Activity (ARE), Adaptation- Climate Specific	0.7	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Lebanon	2022, Agriculture and Rural Empowerment Activity (ARE), Mitigation- Climate Specific	1	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Nepal	2022, Agriculture Direct Financing, Adaptation- Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Egypt	2022, Agriculture in Egypt, Adaptation - Climate Specific	3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ghana	2022, Agriculture Policy (LINK) Activity, Adaptation- Climate Specific	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Zimbabwe	2022, Agriculture/Food Security Activity, Adaptation- Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Madagascar	2022, Agriculture/Livestock Recovery - FAO, Adaptation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Kyrgyz Republic	2022, Agro Trade, Adaptation	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
India	2022, Airport Emergency and Operations Management Pilot Project and Feasibility Study, Adaptation	0.92	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Albania	2022, Albania Energy Security, Mitigation	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Zambia	2022, Alternatives to Charcoal, Mitigation, first	1.705	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Zambia	2022, Alternatives to Charcoal, Mitigation, second	0.16	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Colombia	2022, Amazon Alive, Adaptation	0.81	Committed	Bilateral	ODA	Grant	Adaptation	Forestry

Colombia	2022, Amazon Alive, Mitigation	1.265	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Peru	2022, Amazon Business Alliance, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Latin America & Caribbean Regional	2022, Amazon Fund, Mitigation	3	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Peru, Colombia, Ecuador, Brazil, Guyana, Suriname	2022, Amazon Indigenous Rights and Resources (AIRR), Adaptation	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Forestry
Brazil, Colombia, Peru	2022, Amazonia Connect - To reduce Commodity driven deforestation (CDD) in the Amazon, Mitigation	0.75	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Colombia	2022, Amazonia Connect, Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowships (STPF) - Development Impact Science Corp (DISC), Adaptation	0.073	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowships (STPF) - Development Impact Science Corp (DISC), Mitigation, Cross-Cutting	0.328	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowships (STPF) - Development Impact Science Corp (DISC), Mitigation, Energy	0.293	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowships (STPF), Mitigation	0.466	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2022, AMPLIFY-FP, Adaptation, first	0.35	Committed	Regional	ODA	Grant	Adaptation	Other
Africa Regional	2022, AMPLIFY-FP, Adaptation, second	0.2	Committed	Regional	ODA	Grant	Adaptation	Other
Africa Regional	2022, AMPLIFY-PF Follow-on, Adaptation, first	0.775	Committed	Regional	ODA	Grant	Adaptation	Other
Africa Regional	2022, AMPLIFY-PF Follow-on, Adaptation, second	0.33	Committed	Regional	ODA	Grant	Adaptation	Other
Asia Regional	2022, Analyzing the Importance and Impact of Blue Carbon, Adaptation	0.37	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)

Asia Regional	2022, Analyzing the Importance and Impact of Blue Carbon, Mitigation	0.25	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Jordan	2022, Aqaba Amman Water Desalination and Conveyance Project (AAWDCP), Adaptation	5	Committed	Bilateral	ODA	Grant	Adaptation	other
West Bank and Gaza	2022, Architecture & Engineering Services Firm (A&E) for Building Foundations, Adaptation	5.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Argentina	2022, Argentina food security, Mitigation- Climate Specific-Climate Specific	0.11	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Asia Regional	2022, ASEAN Future Forest Economy, Mitigation	1.5	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2022, Asia Resilient Cities, Adaptation, first	0.708	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, Asia Resilient Cities, Adaptation, second	0.625	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, Asia Resilient Cities, Mitigation	0.4	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Brazil	2022, Assistance to Brazil - Disaster Planning & Response, Adaptation - Climate Specific	0.03	Committed	Bilateral	ODA	Grant	Adaptation	Other
Timor-Leste	2022, Avansa Sistema Aihan no Nutrisaun (SAN)-Advancing Food System and Nutrition, Mitigation- Climate Specific	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Africa Regional	2022, Averda Holdings International Limited, Adaptation	45	Committed	Regional	OOF	Concessional loan	Adaptation	Energy
Europe & Eurasia Regional	2022, Balkans Regional Power Sector Program (PSP) and Mineral Sector Programs, Mitigation	4	Committed	Regional	ODA	Grant	Mitigation	Energy
Global	2022, Bamboo Capital Partners BUILD Fund- LPG, Mitigation	1.25	Committed	Multi-Bilateral	OOF	Loan guarantee	Mitigation	Energy
Bangladesh	2022, Bangladesh Advancing Development & Growth through Energy (BADGE), Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2022, Bangladesh Digital Development Activity (BDDA), Adaptation	0.014	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2022, Bangladesh Digital Development Activity (BDDA), Mitigation	0.014	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
India	2022, Banyan Sustainable Waste Management Private Limite, Mitigation	9	Committed	Bilateral	OOF	Concessional loan	Mitigation	Water and Sanitation

West Bank and Gaza	2022, Basic Infrastructure Support Mechanism (BISM) Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
West Bank and Gaza	2022, Basic Infrastructure Support Mechanism (BISM) Activity, Mitigation	3	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Belize	2022, Belize conservation, Mitigation	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Belize	2022, Belize sustainable forestry, Mitigation	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Indonesia	2022, Bersama Menuju Eliminasi dan Bebas dari TB, Adaptation	1.902	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Serbia	2022, Better Energy Activity, Mitigation	0.82	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Philippines	2022, Biodiversity and Climate Change Activity, Adaptation, first	0.68	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Biodiversity and Climate Change Activity, Adaptation, second	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Biodiversity and Climate Change Activity, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Brazil	2022, Biodiversity and Climate Solutions, Mitigation	3	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Biodiversity Capacity Building, Mitigation	5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Vietnam	2022, Biodiversity Conservation Activity (BCA), Adaptation	1.556	Committed	Bilateral	ODA	Grant	Adaptation	Other
Vietnam	2022, Biodiversity Conservation Activity (BCA), Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, Biodiversity for Resilience (B4R), Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Uganda	2022, Biodiversity for Resilience (B4R), Mitigation	0.8	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Biomass exports, Mitigation	69.14	Committed	Multi-Bilateral	OOF	Export credit	Mitigation	Cross-cutting
Global	2022, Blended Finance Investment Vehicle, Mitigation	8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Mongolia	2022, Bogd Bank LLC, Mitigation	4.5	Committed	Bilateral	OOF	Concessional loan	Mitigation	Cross-Cutting
Bolivia	2022, Bolivia food security, Mitigation- Climate Specific-Climate Specific	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Bolivia	2022, Bolivia food security, Mitigation, first- Climate Specific-Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting

Bolivia	2022, Bolivia food security, Mitigation, second- Climate Specific- Climate Specific	0.16	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Brazil	2022, Brazil nuclear energy, Mitigation	26.24	Committed	Bilateral	OOF	Export credit	Mitigation	Energy
Brazil	2022, Brazil resilience, Mitigation	0.12	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Brazil	2022, Brazil sustainable agriculture, Mitigation, first- Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Brazil	2022, Brazil sustainable agriculture, Mitigation, second- Climate Specific	0.07	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Brazil	2022, Brazil sustainable agriculture, Mitigation, third- Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Bangladesh	2022, Breakthrough ACTION, Adaptation, Bangladesh	0.17	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Cameroon	2022, Breakthrough Action, Adaptation, Cameroon	0.46	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Liberia	2022, Breakthrough Action, Adaptation, Liberia	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Niger	2022, Breakthrough ACTION, Adaptation, Niger	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Sierra Leone	2022, Breakthrough ACTION, Adaptation, Sierra Leone	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Breakthrough-Action, Adaptation	1.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, Brighter Life Kenya 2, Mitigation	15.4	Committed	Bilateral	OOF	Concessional loan	Mitigation	Energy
Africa Regional	2022, Building a Circular Economy for East Africa, Adaptation	0.2	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Building Capacity for Integrated FP/RH and PED Action (BUILD), Adaptation, first	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Building Capacity for Integrated FP/RH and PED Action (BUILD), Adaptation, second	0.8	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Honduras	2022, Building Climate Resilience, Adaptation	4.172	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting

Pakistan	2022, Building Healthy Families, Adaptation - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Honduras	2022, Building Resilience through Markets and Sustainable Coffee Production, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Syria	2022, Building Resilient and Inclusive Communities in Conflict (TO 1) - Essential Services, Good Governance, and Economic Recovery, Adaptation, first	3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Syria	2022, Building Resilient and Inclusive Communities in Conflict (TO 1) - Essential Services, Good Governance, and Economic Recovery, Adaptation, second	2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Burma	2022, Burma Agriculture Policy Support Activity (MAPSA), Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Business Case for Collective Landscape Action, Mitigation, first	0.75	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Business Case for Collective Landscape Action, Mitigation, second	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Egypt	2022, Business Egypt, Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Mongolia	2022, Business Excellence for Sustainability and Transparency (BEST), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Tajikistan	2022, Business Incubation Activity, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Industry
Tajikistan	2022, Business Incubation Activity, Mitigation, Cross-Cutting	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Tajikistan	2022, Business Incubation Activity, Mitigation, Industry	0.425	Committed	Bilateral	ODA	Grant	Mitigation	Industry
Cambodia	2022, Cambodia Malaria Elimination Project 2 (CMEP 2), Adaptation - Climate Specific	1.201	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Suriname, Guyana, Grenada, St. Lucia	2022, Caribbean Business Enabling Environment Reform (CBEE-R), Adaptation	0.35	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St.	2022, Caribbean Climate Investment Program (CCIP), Mitigation	3.95	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy

Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago								
Latin America & Caribbean Regional	2022, Caribbean Digital Infrastructure Resilience and Connectivity Workshop Series, Adaptation	0.05	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Latin America & Caribbean Regional	2022, Caribbean Digital Infrastructure Resilience and Connectivity Workshop Series, Mitigation	0.04	Committed	Regional	ODA	Grant	Mitigation	Energy
Dominican Republic	2022, Caribbean Participating Agency Program Agreement (PAPA), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Antigua and Barbuda, Barbados, The Bahamas, Dominica, Grenada, Guyana, Saint Lucia, St. Kitts and Nevis, St. Vincent and The Grenadines, Suriname and Trinidad and Tobago	2022, Caribbean Regional Technical Assistance Centre (CARTAC) - Improving Public Finances in the Eastern and Southern Caribbean, Adaptation	0.725	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Ethiopia	2022, CATALYZE: Market Systems for Growth, Adaptation	0.262	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Colombia	2022, CDCS Local IMs/GDAs, Mitigation, Cross-Cutting	1.1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Colombia	2022, CDCS Local IMs/GDAs, Mitigation, Energy	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Asia Regional	2022, CEN Regional - Freedom of Expression - Environmental Investigative Journalism, Adaptation	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Egypt	2022, Center of Excellence for Agriculture (COEA), Adaptation-Climate Specific	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Egypt	2022, Center of Excellence for Energy (COEE), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Cambodia	2022, Center of Excellence for Sustainable Agricultural Intensification and Nutrition (CE-SAIN), Adaptation	0.138	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Egypt	2022, Center of Excellence for Water (COEW), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Latin America & Caribbean Regional	2022, Central America Climate Change Adaptation Activity, Adaptation	1.998	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting

Seirra Leone	2022, Central Vector Control Mechanism (PMI), Adaptation	0.601	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Senegal	2022, Central-Level Health System Strengthening, Adaptation - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, CEPI, Coalition for Epidemic Preparedness Innovations , Adaptation, first	4.543	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, CEPI, Coalition for Epidemic Preparedness Innovations , Adaptation, second	0.9	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Nepal	2022, Cereal Systems Initiative for South Asia (CSISA), Adaptation	1.7	Committed	Bilateral	OOF	Grant	Adaptation	Agriculture
Global	2022, CGIAR Fund II (Transfer to RFS), Mitigation	0.125	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Bangladesh	2022, Chittagong Hill Tracts Watershed Co-Management Activity (CHTWCA), Adaptation, Energy	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Bangladesh	2022, Chittagong Hill Tracts Watershed Co-Management Activity (CHTWCA), Adaptation, first	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Bangladesh	2022, Chittagong Hill Tracts Watershed Co-Management Activity (CHTWCA), Adaptation, second	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Tanzania	2022, CIFOR, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2022, CITES, Mitigation	9.17	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Cities Finance Facility, Adaptation	1.251	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Middle East Regional	2022, Civil Society and Environmental Rights - clean energy employment, Adaptation	1.75	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Middle East Regional	2022, Civil Society and Environmental Rights, Adaptation	1.75	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Nepal	2022, Clean Air - Swachchha Hawa, Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kenya, India, Indonesia	2022, Clean Air Catalyst (CAC), Adaptation	0.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Clean Air Catalyst (CAC), Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Clean Cities Blue Ocean (CCBO) Task Order, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries,

								Marine, and Coastal)
South Africa	2022, Clean Energy Activity, Mitigation	2.932	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Clean Energy Demand Initiative (CEDI) – Power Sector Assistance, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Ecuador	2022, Clean Energy Ecuador, Mitigation	3.891	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Clean Energy Emission Reductions (CLEER), Mitigation	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Laos	2022, Clean Energy Loan Guarantee, Mitigation	1.2	Committed	Bilateral	ODA	Loan guarantee	Mitigation	Energy
Global	2022, Clean Energy Ministerial, Mitigation	3.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Clean Energy Transitions Accelerator, Mitigation	2.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Clean Energy Transitions Program, Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Egypt	2022, Clean Energy, Mitigation, Egypt	5.5	Committed	Bilateral	ODA	Grant	Mitigation	other
Iraq	2022, Climate Activity, Adaptation	12.75	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Climate Adaptation and Support Activity (CASA), Adaptation, Other	0.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Climate Adaptation and Support Activity (CASA), Adaptation, Water and Sanitation	0.125	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2022, Climate Adaptation Support Activity (CASA), Adaptation	0.26	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Climate Adaptation Support Activity, Adaptation	0.872	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Climate Ambition “SWAT Teams”, Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Rwanda	2022, Climate and Biodiversity, Adaptation, first	1.8	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Rwanda	2022, Climate and Biodiversity, Adaptation, second	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Global	2022, Climate and Clean Air Coalition (CCAC), Mitigation, Cross-Cutting	1.6	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Climate and Clean Air Coalition (CCAC), Mitigation, Energy	1.6	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Climate and Clean Air Coalition, Mitigation, Cross-Cutting	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Climate and Clean Air Coalition, Mitigation, Energy	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Malawi	2022, Climate Change Adaptation, Adaptation	1.71	Committed	Bilateral	ODA	Grant	Adaptation	Other
Latin America & Caribbean Regional	2022, Climate Finance Access Network, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Latin America & Caribbean Regional	2022, Climate Finance Access Network, Mitigation, Cross-Cutting	0.3	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Latin America & Caribbean Regional	2022, Climate Finance Access Network, Mitigation, Energy	0.3	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2022, Climate Finance Activity, Adaptation	5.508	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Barbados, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2022, Climate Finance and Development Accelerator (CFDA), Adaptation	0.92	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Energy
Barbados and Eastern Caribbean	2022, Climate Finance and Development Accelerator (CFDA), Mitigation, Barbados and Eastern Caribbean	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Barbados, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2022, Climate Finance and Development Accelerator (CFDA), Mitigation, Barbados, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	0.92	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Liberia	2022, Climate Finance for Conservation, Mitigation	0.4	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Climate Finance for Development Accelerator (CFDA) (formerly GRIP), Adaptation	0.091	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Energy

Global	2022, Climate Finance for Development Accelerator (CFDA) (formerly GRIP), Mitigation, first	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2022, Climate Finance for Development Accelerator (CFDA) (formerly GRIP), Mitigation, second	0.55	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2022, Climate Finance for Development Accelerator (CFDA), Adaptation	0.3	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Climate Finance for Development Accelerator (CFDA), Mitigation	1.2	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Colombia	2022, Climate Finance, Adaptation	3.663	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Colombia	2022, Climate Finance, Mitigation, Colombia	5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Peru	2022, Climate Finance, Mitigation, first	1.64	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Peru	2022, Climate Finance, Mitigation, second	0.8	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Climate Monitoring, Evaluation, Training, and Accountability, Mitigation, Forestry	0.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Climate Monitoring, Evaluation, Training, and Accountability, Mitigation, Other	1.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Philippines	2022, Climate Reporting and Other Technical Assessments, Adaptation, first	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Climate Reporting and Other Technical Assessments, Adaptation, second	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Vietnam	2022, Climate Resilient Agriculture in the Mekong Delta, Adaptation, Agriculture- Climate Specific	4.492	Committed	Bilateral	ODA	Grant	Adaptation	other
Vietnam	2022, Climate Resilient Agriculture in the Mekong Delta, Adaptation, Cross-Cutting- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Vietnam	2022, Climate Resilient Agriculture in the Mekong Delta, Mitigation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Philippines	2022, Climate Resilient Cities (CRC), Adaptation	2.477	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Climate Resilient Cities, Mitigation	0.975	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Iraq	2022, Climate Resilient Infastructure, Stabilization, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Energy

Iraq	2022, Climate Resilient Infastructure, Stabilization, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Ethiopia	2022, Climate Resilient WASH, Adaptation	3.752	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2022, Climate risk analysis integration, Adaptation	21.03	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Pakistan	2022, Climate Smart Energy, Mitigation, second	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Climate-Trade Nexus Assessment, Mitigation, Cross-Cutting	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Climate-Trade Nexus Assessment, Mitigation, Energy	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Clmate and health survey, Adaptation	0.83	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Mexico	2022, CO2MUNITARIO, Mitigation	0.575	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Peru	2022, Coffee Alliance for Excellence - CAFE, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Colombia	2022, Colombia agriculture, Mitigation, first- Climate Specific	0.07	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Colombia	2022, Colombia agriculture, Mitigation, second- Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Colombia	2022, Colombia conservation, Mitigation, fourth	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Colombia	2022, Colombia conservation, Mitigation, third	0.29	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Colombia	2022, Colombia food security, Mitigation- Climate Specific-Climate Specific	0.16	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Colombia	2022, Colombia resilience, Mitigation	0.16	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Colombia	2022, Colombia sustainable agriculture, Mitigation- Climate Specific	0.31	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Global	2022, Combating Illegal Logging to Reduce Deforestation, Forest Degradation, and their Associated Emissions, Mitigation	0.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Egypt	2022, Commercial Law Development Program (CLDP), Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Cambodia	2022, COMMIT follow on, Adaptation	0.45	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, Community Epidemic and Pandemic Preparedness Program (CP3), Adaptation	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Uganda	2022, Community Epidemic and Pandemic Preparedness Program (CP3), Mitigation, first	0.07	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Community Epidemic and Pandemic Preparedness Program (CP3), Mitigation, second	0.02	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Liberia	2022, Community Health Activity, Adaptation	0.9	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Jordan	2022, Community Health and Nutrition Activity, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Cambodia	2022, Community Mobilization Initiative to End Tuberculosis (COMMIT), Adaptation	0.28	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Bangladesh	2022, Community Nutrition and Health Activity (CNHA), Adaptation - Climate Specific	0.55	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Guinea	2022, Community Pandemic Preparedness Program (CP3), Adaptation	0.308	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Bangladesh	2022, Community Partnerships to Strengthen Sustainable Development (COMPASS), Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Bangladesh	2022, Community Partnerships to Strengthen Sustainable Development (COMPASS), Mitigation, first	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Bangladesh	2022, Community Partnerships to Strengthen Sustainable Development (COMPASS), Mitigation, second	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Community preparedness and response capacity for natural disasters, Adaptation	30.228	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Lebanon	2022, Community Support Program, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Tajikistan	2022, Comprehensive Action for Climate Change Initiative Activity (CACCI), Mitigation, first	0.375	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Tajikistan	2022, Comprehensive Action for Climate Change Initiative Activity (CACCI), Mitigation, second	0.125	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2022, Comprehensive Action for Climate Change Initiative (CACCI) - Agriculture, Adaptation, first- Climate Specific	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Comprehensive Action for Climate Change Initiative (CACCI) - Agriculture, Adaptation, second- Climate Specific	0.4	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Comprehensive Action for Climate Change Initiative (CACCI), Mitigation	0.2	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting

Europe & Eurasia Regional	2022, Connect For Growth (C4G), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Kenya	2022, Conservation Policy Program, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Other
Republic Of Congo	2022, Conservation through Economic Empowerment in Republic of Congo, Mitigation, first	2.6	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Republic Of Congo	2022, Conservation through Economic Empowerment in Republic of Congo, Mitigation, second	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Republic Of Congo	2022, Conservation through Economic Empowerment in Republic of Congo, Mitigation, third	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Conservation Volunteers, Mitigation, first	0.911	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Conservation Volunteers, Mitigation, second	0.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Liberia	2022, Conservation Works Activity, Mitigation	0.35	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Cambodia	2022, CONSERVE (Carbon Off-set Nature Strengthening through Ecotourism, Revenue-Sharing, and Community Engagement), Adaptation	1.2	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Cambodia	2022, CONSERVE (Carbon Off-set Nature Strengthening through Ecotourism, Revenue-Sharing, and Community Engagement), Mitigation, first	2.61	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Cambodia	2022, CONSERVE (Carbon Off-set Nature Strengthening through Ecotourism, Revenue-Sharing, and Community Engagement), Mitigation, second	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Honduras	2022, Conserving Coastal Ecosystems, Adaptation	1.121	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Nepal	2022, Contribution for E-mobility, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kenya	2022, CORE Group Partners Project (CGPP), Adaptation, Kenya	0.073	Committed	Bilateral	ODA	Grant	Adaptation	Other
Nigeria	2022, CORE Group Partners Project (CGPP), Adaptation, Nigeria	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Core Group Polio Project, Adaptation, Other	1.09	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Core Group Polio Project, Adaptation, Other (Health) - Climate Specific	2.8	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Costa Rica	2022, Costa Rica resilience, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting

Global	2022, Counter Illicit Natural Resource Trafficking, Mitigation	1.38	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Africa Regional	2022, Counter Wildlife Trafficking Department of Interior PAPA, Adaptation, first	0.2	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Counter Wildlife Trafficking Department of Interior PAPA, Adaptation, second	0.187	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Thailand	2022, Country Health Information Systems and Data Use (CHISU), Adaptation, Thailand - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Liberia	2022, Countywide Sanitation Activity (CWSA), Adaptation	0.95	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, CPS/CVP Global Reconciliation Fund Program, Adaptation	2.7	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Guatemala	2022, Creating Economic Opportunities (CEO), Mitigation	0.475	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Honduras	2022, Creating Rural Opportunities and Prosperity in Agriculture for a Resilient Future, Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Cross Border Resilience Community (CBRC) Activity, Adaptation	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Data Analytics Hub - GH DATA, Adaptation	0.008	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Madagascar	2022, Deforestation-One Health Linkage, Adaptation - Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, DEIC Enviromental Security Activity, Adaptation	1.44	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Demographic Health Survey (DHS-8), Adaptation, first - Climate Specific	0.4	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Demographic Health Survey (DHS-8), Adaptation, second - Climate Specific	0.1	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Demographic Health Surveys Program 2024, Adaptation - Climate Specific	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Colombia	2022, Destination Nature, Mitigation, first	1.651	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Colombia	2022, Destination Nature, Mitigation, second	1.349	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting

Sierra Leone	2022, DHS-8, Adaptation	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ethiopia	2022, Digital Health Activity (DHA), Adaptation - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Burma	2022, Digital Square Project, Mitigation	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Other
Asia Regional	2022, Diminishing Dengue, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Marshall Islands	2022, Disaster Resilience in the Compact Nations (RESILIENCE) activity, Adaptation, Marshall Islands	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Micronesia	2022, Disaster Resilience in the Compact Nations (RESILIENCE) activity, Adaptation, Micronesia	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Disaster response preparedness , Adaptation	1.503	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Jamaica	2022, Disaster Risk Reduction Activity, Adaptation	2.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Guatemala	2022, Discovery and Exploration of Emerging Pathogens - Viral Zooneses (DEEP VZN), Adaptation	1.257	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
India	2022, Diversifying Partnerships in WASH Program, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Dominican Republic	2022, DR agroforestry, Mitigation, first	0.22	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Dominican Republic	2022, DR agroforestry, Mitigation, second	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Early Recovery, Risk Reduction, and Resilience (ER4) Resilience Food Security Activities (RFSAs), Adaptation-Climate Specific	50	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Early warning systems, Adaptation	55.703	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Africa Regional	2022, East Africa Economic Reform and Recovery Activity (ERRA), Adaptation, Cross-Cutting	0.2	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, East Africa Economic Reform and Recovery Activity (ERRA), Adaptation, Energy	0.202	Committed	Regional	ODA	Grant	Adaptation	Energy
Latin America & Caribbean Regional	2022, Eastern Caribbean food security, Mitigation- Climate Specific	0.32	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Latin America & Caribbean Regional	2022, Eastern Caribbean resilience, Mitigation	0.39	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting

Europe & Eurasia Regional	2022, EBRD Small Business Initiative, Mitigation	0.821	Committed	Regional	ODA	Grant	Mitigation	Energy
Mozambique	2022, Eco Farm Mocambique Limitada, Adaptation	2.8	Committed	Bilateral	OOF	Concessional loan	Adaptation	Agriculture
Colombia	2022, Economic Inclusion for Migrants, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Yemen	2022, Economic Recovery and Livelihoods Project (ERLP), Adaptation, Agriculture- Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Yemen	2022, Economic Recovery and Livelihoods Project (ERLP), Adaptation, Cross-cutting	6.5	Committed	Bilateral	OOF	Grant	Adaptation	Cross-cutting
Yemen	2022, Economic Recovery and Livelihoods Project (ERLP), Mitigation	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Africa Regional	2022, Ecosystem Restoration and Climate Resilience in East Africa’s Transboundary Landscapes , Adaptation, first	0.354	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Ecosystem Restoration and Climate Resilience in East Africa’s Transboundary Landscapes , Adaptation, Other	2	Committed	Regional	ODA	Grant	Adaptation	Other
Africa Regional	2022, Ecosystem Restoration and Climate Resilience in East Africa’s Transboundary Landscapes , Adaptation, second	0.1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Bangladesh	2022, Ecosystems (Protibesh), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Bangladesh	2022, Ecosystems (Protibesh), Adaptation, first	1.35	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Bangladesh	2022, Ecosystems (Protibesh), Mitigation	0.85	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, EDGE Certification Pilot, Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Indonesia	2022, Effective Marine Conservation or Konservasi Laut Efektif, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
West Bank and Gaza	2022, Effective Water Resources Management For Irrigation Activity, Adaptation	7.5	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
West Bank and Gaza	2022, Effective Water Resources Management For Irrigation Activity, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Egypt	2022, Egypt Nexus for Water, Food, and Energy Platform (NWFE), Mitigation- Climate Specific- Climate Specific	25	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Egypt	2022, Egyptian Pioneers, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
El Salvador	2022, El Salvador sustainable agriculture, Mitigation- Climate Specific	0.34	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
El Salvador	2022, El Salvador youth development, Mitigation	0.08	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Brazil	2022, Electricity Distribution Investment Plan Technical Assistance, Mitigation	0.65	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, ELEVATE, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Asia Regional	2022, Elevating Women Climate Entrepreneurs at APEC 2023, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Tajikistan	2022, Eliminating TB in Central Asia - ETICA, Adaptation	0.65	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Mali	2022, Emergency Center for Transboundary Animal Diseases (ECTAD) /F.A.O, Adaptation	1.16	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Mozambique	2022, Emergency Center for Transboundary Animal Diseases (ECTAD), Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ethiopia	2022, Empowered Communities for Health, Adaptation - Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, Empowering women to adapt to climate change in Northern Kenya, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tajikistan	2022, End TB in Tajikistan Activity, Adaptation	0.79	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Ending AIDS in West Africa (EAWA), Adaptation	0.3	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Ending AIDS in West Africa (EAWA), Adaptation, first	0.4	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Global	2022, Energy Evaluation and Learning Framework, Mitigation	0.259	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Bosnia and Herzegovina	2022, Energy Policy Activity, Mitigation	0.8	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Energy Regulatory Partnership Program (ERPP), Mitigation	0.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Latin America & Caribbean Regional	2022, Energy Resilience and Security in the Caribbean, Mitigation	2.5	Committed	Regional	ODA	Grant	Mitigation	Energy

India	2022, Energy Resiliency Virtual Workshop Series, Mitigation	0.29	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2022, Energy Sector Reform (ESR) Activity, Mitigation	0.34	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2022, Energy Sector Reform (ESR) Activity, Mitigation, first	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Jordan	2022, Energy Sector Support Activity ERA Task Order 2, Mitigation	3	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Jordan	2022, Energy Sector Support Activity ERA Task Order 2, Mitigation, first	5	Committed	Bilateral	ODA	Grant	Mitigation	other
Armenia	2022, Energy Secure Armenia, Mitigation	0.85	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Armenia	2022, Energy Secure Armenia, Mitigation, first	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Armenia	2022, Energy Secure Armenia, Mitigation, second	1.6	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Philippines	2022, Energy Secure Philippines (ESP), Adaptation	1.1	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Philippines	2022, Energy Secure Philippines (ESP), Mitigation	5.732	Committed	Bilateral	ODA	Grant	Mitigation	other
North Macedonia	2022, Energy Security Activities, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Ukraine	2022, Energy Security Project (ESP), Mitigation	6	Committed	Bilateral	ODA	Grant	Mitigation	other
Kosovo	2022, Energy Sustainability Activity, Mitigation	0.75	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Bangladesh	2022, Enhanced Coastal Fisheries (ECOFISH) II Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Indonesia	2022, Enhanced Multi Drug Resistant Tuberculosis (MDR-TB) Services through Network of Private Hospital - MENTARI TB, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Liberia	2022, Enhancing WASH, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Africa Regional	2022, ENV- Coalition for Private Sector Investment in Conservation, Adaptation	0.01	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, ENV- Coalition for Private Sector Investment in Conservation, Adaptation, first	0.2	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Environment Program Cycle Field Support, Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Africa Regional	2022, Environment Regional Institution Support Activity, Adaptation	1.5	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2022, Environment Regional Institution Support Activity, Mitigation	1.25	Committed	Regional	ODA	Grant	Mitigation	Other
Africa Regional	2022, Environment Regional Learning and Collaboration Activity, Adaptation	0.289	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Latin America & Caribbean Regional	2022, Environmental Defenders, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Barbados, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2022, Environmental Support Services Contract (ESSC), Adaptation	0.386	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Barbados, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala,	2022, Environmental Support Services Contract (ESSC), Mitigation, Cross-Cutting	0.1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting

Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru								
Barbados, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru	2022, Environmental Support Services Contract (ESSC), Mitigation, Energy	0.196	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Environmental Travel, Adaptation	0.09	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Environmental Travel, Adaptation, first	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Environmental Travel, Mitigation	0.145	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Global	2022, Environmental Travel, Mitigation, second	0.278	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
El Salvador	2022, EPIC, Adaptation	0.116	Committed	Bilateral	OOF	Grant	Adaptation	Other
Ethiopia	2022, Ethiopia Resilience Learning Activity (RLA), Adaptation	0.071	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
India	2022, Evergreen Viento Tamil Nadu Windfarm, Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Zambia	2022, Evidence for Health, Adaptation - Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Evidence for Health, Adaptation, first - Climate Specific	0.095	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Expanding Water, Sanitation and Hygiene (Formerly WASH - GIP), Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Zambia	2022, Expanding Water, Sanitation and Hygiene, Adaptation	0.152	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Zambia	2022, Family Health and Nutrition, Adaptation - Climate Specific	0.215	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Family Health and Nutrition, Adaptation, first - Climate Specific	0.696	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ghana	2022, FAO PIO Agreement Amendment 30, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Bangladesh, Burma, Cambodia, India, Indonesia, Laos, Nepal, Philippines, Thailand, and Vietnam	2022, FAO/Global Health Security Project, Adaptation - Climate Specific	0.863	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Madagascar	2022, Feed the Future and Resilience Assessments - Agriculture and Adaptation, Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Madagascar	2022, Feed the Future and Resilience Assessments - Agriculture and Adaptation, Adaptation, first- Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Cambodia	2022, Feed the Future Cambodia Harvest III, Adaptation	1.6	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Cambodia	2022, Feed the Future Cambodia Harvest III, Adaptation, second	1.885	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Cambodia	2022, Feed the Future Cambodia Harvest III, Mitigation	0.75	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Egypt	2022, Feed the Future Egypt Rural Agribusiness Strengthening (ERAS), Adaptation	2.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ethiopia	2022, Feed the Future Ethiopia Highlands Resilience Activity (HRA), Adaptation	4.138	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Ghana	2022, Feed the Future Ghana Fisheries Recovery Activity (GFRA), Adaptation	2.85	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ghana	2022, Feed the Future Ghana Fisheries Recovery Activity (GFRA), Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Rwanda	2022, Feed the Future Hinga Wunguke (Modernizing Agriculture Activity), Adaptation- Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Niger	2022, Feed the Future Innovation Lab for Current and Emerging Threats to Crops (CETCIL), Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Niger	2022, Feed the Future Innovation Lab for Current and Emerging Threats to Crops (CETCIL), Adaptation, first	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Feed the Future Innovation Lab for Horticulture, Adaptation,	0.15	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Niger	2022, Feed the Future Innovation Lab for Horticulture, Adaptation, Niger	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nigeria	2022, Feed the Future Nigeria Integrated Agricultural Activity, Adaptation	0.203	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Nigeria	2022, Feed the Future Nigeria Rural Resilience Activity, Adaptation	0.203	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2022, Feed the Future Policy Systems Services Activity, Adaptation	2.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2022, Feed the Future Senegal Dekkal Geej, Adaptation	1.195	Committed	Bilateral	ODA	Grant	Adaptation	Other
Senegal	2022, Feed the Future Senegal Fertilizer Activity (Dundël Suuf), Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Senegal	2022, Feed the Future Senegal Value Chain Services Activity, Adaptation	1.9	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Burma	2022, Fish for Livelihoods, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Philippines	2022, Fish Right, Adaptation	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2022, Flagship Caribbean Marine Biodiversity Activity, Adaptation	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Peru	2022, FOEST+, Mitigation	2.24	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Cambodia	2022, Follow-on to the Vector Link Project, Adaptation	1.302	Committed	Bilateral	ODA	Grant	Adaptation	Other
Indonesia	2022, FOLU Net Sink, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Bangladesh	2022, Food and Agriculture Organization (FAO) Umbrella Grant, Adaptation- Climate Specific- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Cameroon	2022, Food and Agriculture Organization Global Health Security Project (FAO/GHS), Adaptation- Climate Specific	0.307	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kenya	2022, Food and Agriculture Organization of the United Nations (FAO) GH Umbrella PIO Grant, Adaptation- Climate Specific	0.107	Committed	Bilateral	ODA	Grant	Adaptation	Other

Cambodia	2022, Food and Agriculture Organization of the United Nations (FAO) Umbrella Grant, Adaptation- Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other
Nigeria	2022, Food and Agriculture Organization of the United Nations, Adaptation- Climate Specific	0.9	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Tajikistan	2022, Food and Agriculture Organization, Adaptation- Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other
Africa Regional	2022, Food Security, Adaptation- Climate Specific- Climate Specific	42	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Honduras	2022, Food Security, Agriculture and Resilient Market Systems (FARMS), Adaptation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Liberia	2022, Food Security, Nutrition and Resilience Activity, Adaptation- Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Peru	2022, Forest Alliance, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Africa Regional	2022, Forest And Biodiversity Support Activity, Mitigation	0.7	Committed	Regional	ODA	Grant	Mitigation	Forestry
Global	2022, Forest and Climate Leaders' Partnership, Mitigation	0.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Forest carbon monitoring, Mitigation	3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Paraguay	2022, Forest Conservation Agriculture Project, Mitigation- Climate Specific	0.975	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Brazil, Colombia, Ecuador, Peru	2022, Forest Management and Fire Regional Program., Mitigation	0.85	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Indonesia	2022, Forest Resources Management, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Forest Transparency and Traceability: SilvaCarbon and Climate Fellows, Mitigation	2.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Solomon Islands	2022, Forest Value Enhancement Project, Mitigation	6.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Africa Regional	2022, Forestry and Biodiversity Support Activity (FABS), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Global	2022, Forestry management, Mitigation	0.75	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Forestry management, Mitigation, fourth	1.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Forestry management, Mitigation, third	9.2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry

Kenya	2022, FP/RMNCAH and Nutrition in Turkana, Adaptation	2.303	Committed	Bilateral	ODA	Grant	Adaptation	Other
Asia Regional	2022, From Asia's High Mountains to Pacific Islands, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, From Asia's High Mountains to Pacific Islands, Mitigation	0.023	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Asia Regional	2022, From Asia's High Mountains to Pacific Islands, Mitigation, first	0.078	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Bangladesh	2022, FTF Aquaculture and Nutrition Activity, Adaptation	0.7	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2022, FTF Bangladesh Inclusive Access to Finance Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2022, FTF Bangladesh Livestock and Nutrition Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2022, FTF Bangladesh Livestock and Nutrition Activity, Mitigation	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Ethiopia	2022, FTF Ethiopia Land Governance Activity, Adaptation	0.489	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ethiopia	2022, FTF Global Supporting Seed Systems for Development (S34D), Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2022, FTF Inclusive Agricultural Markets (IAM) Activity, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Mozambique	2022, FTF Integrated Resilience in Nutrition and Agriculture (FTF-RESINA), Adaptation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, FTF Soil Fertility Technology Adoption, Policy Reform and Knowledge Management Project (IP: IFDC), Adaptation	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Nepal	2022, G2G Clean Energy Access/Organic Solid Waste Management (GCC/Clean Energy), Mitigation	0.7	Committed	Bilateral	ODA	Grant	Mitigation	Energy
The Gambia	2022, Gambia low-carbon energy, Mitigation	20	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Democratic Republic Of The Congo	2022, Garamba Alliance Activity (Hearth Garamba), Adaptation	0.015	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Garamba Alliance Activity (Hearth Garamba), Mitigation	0.75	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Global	2022, Gavi, the Vaccine Alliance PIO Agreement, Adaptation	24.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Fiji	2022, GEEA Fund, Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy

Latin America & Caribbean Regional	2022, GEF LatAm Climate Solutions Fund III, Mitigation	25	Committed	Regional	OOF	Equity	Mitigation	Cross-cutting
India	2022, GEF South Asia Growth Fund III, Mitigation	50	Committed	Bilateral	OOF	Equity	Mitigation	Cross-cutting
Global	2022, Gender Equity and Equality Fund (GEEA), Adaptation	3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, Gender Equity and Equality Fund (GEEA), Mitigation,	0.3	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Algeria	2022, Gender Equity and Equality Fund (GEEA), Mitigation, Algeria	1.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Gender Equity and Equality Fund (GEEA), Mitigation, Multi-Country	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, GenDev - Advancing Gender in the Environment (AGENT), Adaptation	2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, GENDEV: Climate Gender Equity Fund (CGEF), Adaptation	0.2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, GENDEV: Climate Gender Equity Fund (CGEF), Adaptation, first	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, GENDEV: Gender Lens Investing and Energy Financing for Women, Adaptation	0.2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, GENDEV: IUCN GEEA Fund Incentive Fund, Adaptation	14.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Niger	2022, GENDEV: People-to-People Reconciliation Fund APS--Niger, Gender Inequality and Climate-Conflict Nexus, Adaptation	2.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, GENDEV: Women Empowered as Clean Air Catalysts, Adaptation	2.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, GENDEV: Women's Empowerment in Green Cities, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, GENDEV: Women's Empowerment in Green Cities, Adaptation, first	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, GENDEV: Women's Land Rights through Integrated Land and Resource Governance (ILRG) and ACE, Adaptation	1.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting

Kenya	2022, GENDEV: Gender Equity and Women's Empowerment for Climate Action in Kenya, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Peru	2022, GENDEV: Gender-Responsive Climate Action, Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ghana	2022, Ghana Health Service G2G II, Adaptation - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uzbekistan	2022, GHS - UNICEF, Adaptation	0.26	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uzbekistan	2022, GHS - WHO, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Rwanda	2022, GHS, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Democratic Republic Of The Congo	2022, GHSC Francophone TO, Adaptation	2.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Democratic Republic Of The Congo	2022, GHSC/ PSM Malaria TO 2, Adaptation - Climate Specific	9.7	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Burkina Faso	2022, GHSD contribution to FAO, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Gigaton Empowerment Fund, Mitigation	100	Committed	Regional	OOF	Concessional loan	Mitigation	Energy
Global	2022, Global - Gender - Strategies for Mitigating Tech-Facilitated Gender-Based Violence (TFGBV), Adaptation	0.25	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Global - Gender - Strategies for Mitigating Tech-Facilitated Gender-Based Violence (TFGBV), Adaptation, first	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Global Climate Action Partnership (GCAP), Mitigation, Cross-Cutting	2.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Global Climate Action Partnership (GCAP), Mitigation, Energy	2.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Timor-Leste	2022, Global Climate Change Adaptation and Biodiversity, Adaptation	1.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Global Fertilizer Challenge, Mitigation	25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Global Forest Watch 3.0, Mitigation	0.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry

Global	2022, Global Green Hydrogen Program, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Kyrgyz Republic	2022, Global Health Security (PIO) (Food and Agriculture Organization/Global Health Security Project), Adaptation-Climate Specific	0.59	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kyrgyz Republic	2022, Global Health Security (PIO) (World Health Organization Consolidated Grant II), Adaptation - Climate Specific	0.44	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kyrgyz Republic	2022, Global Health Security (GHS) (Meeting Targets and Maintaining Epidemic Control - EpiC), Adaptation - Climate Specific	1.09	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Brazil	2022, Global Health Security (GHS), Adaptation - Climate Specific	0.055	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Guatemala	2022, Global Health Security (GHS), Adaptation, Guatemala - Climate Specific	0.231	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Brazil	2022, Global Health Security (GHS), Adaptation, second - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Brazil	2022, Global Health Security (GHS), Adaptation, third - Climate Specific	0.15	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Nepal	2022, Global Health Security in Development (GHSD) - FAO New, Adaptation - Climate Specific	0.618	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nepal	2022, Global Health Security in Development (GHSD) - WHO, Adaptation - Climate Specific	0.618	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Global Health Security Innovation Challenge, Adaptation - Climate Specific	0.616	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Global Health Security Program - United Nations Food and Agriculture Organization (FAO), Adaptation- Climate Specific	0.202	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Asia Regional	2022, Global Health Security Project (partner with FAO), Adaptation, - Climate Specific	0.512	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Honduras	2022, Global Health Security Project (partner with FAO), Adaptation, Honduras - Climate Specific	0.168	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Guinea	2022, Global Health Security Project, Adaptation - Climate Specific	0.31	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Asia Regional	2022, Global health security, Adaptation, - Climate Specific	0.512	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Kazakhstan	2022, Global health security, Adaptation, first - Climate Specific	0.675	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kazakhstan	2022, Global health security, Adaptation, fourth - Climate Specific	0.65	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Pakistan	2022, Global Health Security, Adaptation, Pakistan - Climate Specific	0.718	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Laos, Thailand	2022, Global Health Supply Chain - Procurement and Supply Management (GHSC-PSM), Adaptation - Climate Specific	0.05	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Malawi	2022, Global Health Supply Chain – Procurement and Supply Management (GHSC-PSM), Adaptation - Climate Specific	1.495	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, Global Health Supply Chain - Procurement and Supply Management (GHSC-PSM), Mitigation - Climate Specific	0.35	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Nigeria	2022, Global Health Supply Chain - Procurement Supply Management (GHSC - PSM), Adaptation - Climate Specific	7.493	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Burma	2022, Global Health Supply Chain – Procurement Supply Management (PSM), Adaptation - Climate Specific	0.061	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Burma	2022, Global Health Supply Chain – Procurement Supply Management (PSM), Mitigation - Climate Specific	0.351	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Sierra Leone	2022, Global Health Supply Chain (GHSC) - PSM project, Adaptation - Climate Specific	0.61	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Rwanda	2022, Global Health Supply Chain for Procurement and Supply Management (GHSC-PSM), Adaptation - Climate Specific	1.418	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Cameroon	2022, Global Health Supply Chain Procurement and Supply Management Malaria (GHSC-PSM) Task Order 2, Adaptation - Climate Specific	0.826	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Global Health Supply Chain Procurement and Supply Management Project, Adaptation - Climate Specific	2.381	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ghana	2022, Global Health Supply Chain-Procurement and Supply Management (GHSC-PSM) Task Order 2 - Malaria, Adaptation - Climate Specific	1.6	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Ghana	2022, Global Health Supply Chain-Procurement and Supply Management (GHSC-PSM) Task Order 2 - Malaria, Mitigation - Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Liberia	2022, Global Health Supply Chain-Procurement and Supply Management project- Technical Assistance, Adaptation - Climate Specific	0.445	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Global Innovation through Science and Technology (GIST), Adaptation	0.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Global Methane Initiative, Mitigation	0.91	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Global Methane Initiative, Mitigation, Cross-Cutting	1.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Global Methane Initiative, Mitigation, first	1.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Global Methane Initiative, Mitigation, second	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Global Ocean Carbon Network, Adaptation	4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Global	2022, Global Power System Transformation Consortium (G-PST Consortium), Mitigation	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
India	2022, Global Procurement Initiative: Interstate Clean Energy Procurement Program, Mitigation	1.99	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Global TB Drug Facility, Adaptation	0.778	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Global TB Drug Facility, Adaptation, first	1.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Global TB Drug Facility, Mitigation	0.35	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Colombia	2022, Golden Land, Mitigation	2.7	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Malawi	2022, Golomoti JCM Solar Corporation Limited, Mitigation	25	Committed	Bilateral	OOF	Concessional loan	Mitigation	Energy

Georgia	2022, Green Agriculture Program, Adaptation- Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Georgia	2022, Green Economy Program, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Green Recovery Investment Platform (GRIP) - Climate Finance, Adaptation	0.9	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Forestry
Global	2022, Green Recovery Investment Platform (GRIP) - Climate Finance, Mitigation	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Green Shipping Corridor Initiation Project (GSCIP), Mitigation	1.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Kenya	2022, Ground Water Exploration and Assessment, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Malawi	2022, Growth Poles Project, Adaptation	3.25	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Guatemala	2022, Guatemala ecotourism, Mitigation	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Guatemala	2022, Guatemala food security, Mitigation- Climate Specific	0.28	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Guatemala	2022, Guatemala resilience, Mitigation	0.24	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Guatemala	2022, Guatemala resilience, Mitigation, first	0.38	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Guatemala	2022, Guatemala sustainable agriculture, Mitigation- Climate Specific	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Guatemala	2022, Guatemala sustainable agriculture, Mitigation, first-Climate Specific	0.31	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Uganda	2022, Gulu Regional Referral Hospital Strengthening Project (GRRH), Adaptation	0.001	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Uganda	2022, Gulu Regional Referral Hospital Strengthening Project (GRRH), Mitigation	0.002	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, Gulu Regional Referral Hospital Strengthening Project (GRRH), Mitigation, first	0.007	Committed	Bilateral	ODA	Grant	Mitigation	Other
Haiti	2022, Haiti conservation, Mitigation	0.28	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Haiti	2022, Haiti food security, Mitigation, first- Climate Specific	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting

Haiti	2022, Haiti food security, Mitigation, second- Climate Specific	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Haiti	2022, Haiti resilience, Mitigation	0.05	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Haiti	2022, Haiti resilience, Mitigation, first	0.36	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Haiti	2022, Haiti sustainable agriculture, Mitigation- Climate Specific	0.13	Committed	Bilateral	OOF	Grant	Mitigation	Agriculture
Indonesia	2022, HDF Energy Indonesia, Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Uganda	2022, Health Care Waste Management Activity, Adaptation - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Health Care Waste Management Activity, Mitigation - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Health Care Waste Management Activity, Mitigation, first - Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Nepal	2022, Health Direct Financing Project, Adaptation - Climate Specific	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Guinea	2022, Health Facility Electrification Project, Mitigation - Climate Specific	0.817	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kenya	2022, Health Financing and Social Protection Systems for Health Activity, Adaptation - Climate Specific	0.006	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Senegal	2022, Health G2G Activity, Adaptation - Climate Specific	2.875	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, Health Governance and Strategic Partnerships, Adaptation - Climate Specific	0.006	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Health Service Delivery in Nigeria, Adaptation - Climate Specific	0.616	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Jordan	2022, Health Services Quality Accelerator, Adaptation - Climate Specific	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Timor-Leste	2022, Health System Sustainability (HSS), Adaptation - Climate Specific	0.176	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Health systems resilience and capacity activity, Mitigation - Climate Specific	0.55	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, Health Systems Strengthening Accelerator (HSSA), Adaptation - Climate Specific	0.175	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)

Global	2022, Health Systems Strengthening Accelerator (HSSA), Adaptation, first - Climate Specific	0.59	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Ethiopia	2022, Health Workforce Improvement Program (HWIP), Adaptation - Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Health, Ecosystems and Agriculture for Resilient, Thriving Societies Global development Alliance (HEARTH GDA), Adaptation- Climate Specific	0.3	Committed	Regional	ODA	Grant	Adaptation	Forestry
Africa Regional	2022, Health, Ecosystems and Agriculture for Resilient, Thriving Societies Global development Alliance (HEARTH GDA), Mitigation- Climate Specific	1.25	Committed	Regional	ODA	Grant	Mitigation	Other (Health)
Sierra Leone	2022, Healthgrid Sierra Leone, Mitigation - Climate Specific	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kenya	2022, HealthIT: Sustaining Use of District Health Information System II, Adaptation - Climate Specific	0.023	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ethiopia	2022, Healthy Behavior Activity, Adaptation - Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Tajikistan	2022, Healthy Mother, Healthy Baby, Adaptation - Climate Specific	0.778	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, HEARTH-Okavango, Adaptation	0.44	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, HEARTH-Okavango, Adaptation, first	2.25	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, HEARTH-Okavango, Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Tanzania	2022, Heshimu Bahari (“We Respect the Ocean”), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Tanzania	2022, Heshimu Bahari (“We Respect the Ocean”), Adaptation, first	1.6	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Burma	2022, High Impact MCH (HI-MCH), Adaptation	0.639	Committed	Bilateral	ODA	Grant	Adaptation	Other

Honduras	2022, Honduras food security, Mitigation- Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Honduras	2022, Honduras food security, Mitigation, first- Climate Specific	0.27	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Honduras	2022, Honduras marine conservation, Mitigation	0.35	Committed	Bilateral	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)
Honduras	2022, Honduras resilience, Mitigation	0.37	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Honduras	2022, Honduras solar, Mitigation	61.18	Committed	Bilateral	OOF	Export credit	Mitigation	Energy
Honduras	2022, Honduras water resource management, Mitigation	0.29	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Honduras	2022, Honduras watershed management, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Ethiopia	2022, House Hold Economy Approach -Utilization Follow on, Adaptation	0.42	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Liberia	2022, HSS activity, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, IAEA Dialogue Forum, Adaptation	0.11	Committed	Regional	ODA	Grant	Adaptation	Other
Global	2022, ID - Disability Program funds allowed to missions through field allowances, Adaptation	8.805	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Vietnam	2022, IDEAL buy-in mechanism, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Lebanon	2022, IDEAS - Innovation for Affordable and Renewable Energy for All (INARA), Mitigation	4	Committed	Bilateral	ODA	Grant	Mitigation	other
Lebanon	2022, IDEAS - Promoting Sustainable Livelihoods (PSL), Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Lebanon	2022, IDEAS - Promoting Sustainable Livelihoods (PSL), Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Haiti	2022, IHSD - Integrated Health Resilience, Adaptation - Climate Specific	2.475	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Indonesia	2022, IKN Forest City Planning - Green Cities, Mitigation	0.9	Committed	Bilateral	ODA	Grant	Mitigation	Forestry

Democratic Republic Of The Congo	2022, IMET Funding, Adaptation	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Other
Seirra Leone	2022, Impact Malaria, Adaptation - Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Guatemala	2022, Improved Health and Nutrition Activity, Adaptation - Climate Specific	0.432	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Improving Collaborative Conservation and Management of Transboundary Natural Resources in East Africa, Adaptation	0.232	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Improving Collaborative Conservation and Management of Transboundary Natural Resources in East Africa, Mitigation	0.41	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Colombia	2022, Inclusive Justice, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Somalia	2022, Inclusive Resilience in Somalia (IRiS), Adaptation	2.665	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Incubating Blended Finance Vehicles for Adaptation, Adaptation	2.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Colombia	2022, Indigenous Peoples and Afro-Colombian Empowerment Activity, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Indigenous Peoples Finance Access Facility (IPFAF), Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Indonesia	2022, Indonesia MEL Platform, Adaptation	0.28	Committed	Bilateral	ODA	Grant	Adaptation	Other
Indonesia	2022, Indonesia MEL Platform, Mitigation	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Other
Indonesia	2022, Indonesia MEL Platform, Mitigation, first	0.305	Committed	Bilateral	ODA	Grant	Mitigation	Other
Indonesia	2022, Indonesia Municipal Solid Waste Management (SELARAS), Adaptation	0.482	Committed	Bilateral	ODA	Grant	Adaptation	Other
Indonesia	2022, Indonesia Urban Resilient Water, Sanitation and Hygiene (IUWASH Tangguh), Adaptation	0.915	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Indonesia	2022, Indonesia Urban Resilient Water, Sanitation and Hygiene (IUWASH Tangguh), Adaptation, first	1.637	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Rwanda	2022, Indoor Residual Spraying (IRS) Follow on, Adaptation	0.368	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Industrial Decarbonization, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Infectious Disease Detection and Surveillance (IDDS), Adaptation,	3	Committed	Regional	ODA	Grant	Adaptation	Other (Health)

Cambodia	2022, Infectious Disease Detection and Surveillance (IDDS), Adaptation, Cambodia	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Liberia	2022, Infectious Disease Detection and Surveillance (IDDS), Adaptation, Liberia	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Mali	2022, Infectious Disease Detection and Surveillance (IDDS), Adaptation, Mali	1.15	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Niger	2022, Infectious Disease Detection and Surveillance (IDDS), Adaptation, Niger	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Infectious Disease Detection and Surveillance, Adaptation	0.005	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Infectious Disease Detection and Surveillance, Mitigation	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Infectious Disease Detection and Surveillance, Mitigation, first	0.035	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Asia Regional	2022, Information Services for Resilience - Pacific, Adaptation	15	Committed	Regional	ODA	Grant	Adaptation	Other
Rwanda	2022, Ingobyi Follow on, Adaptation	0.705	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, INNOVATION LAB FOR LIVESTOCK SYSTEMS, Adaptation,	0.15	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Somalia	2022, INNOVATION LAB FOR LIVESTOCK SYSTEMS, Adaptation, Somalia	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2022, Institutional and Systems Strengthening (ISS) Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Institutional Support Contract - Climate (TOPS), Adaptation	0.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Institutional Support Contract - Climate (TOPS), Mitigation	0.066	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Nigeria	2022, Integrated Health Program (IHP) Task Order Five (TO5), Adaptation - Climate Specific	0.226	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Integrated Health Program (IHP) Task Order Four (TO4), Adaptation - Climate Specific	0.26	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Integrated Health Program (IHP) Task Order Seven (TO7), Adaptation - Climate Specific	0.295	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Integrated Health Program (IHP) Task Order Six (TO6), Adaptation - Climate Specific	0.692	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Nigeria	2022, Integrated Health Program (IHP) Task Order Three (TO3), Adaptation - Climate Specific	0.215	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Burkina Faso	2022, Integrated Health Services (IHS), Adaptation - Climate Specific	4.36	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Pakistan	2022, Integrated Health System Strengthening, Adaptation - Climate Specific	3.7	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Integrated Health Systems Strengthening, Adaptation - Climate Specific	0.616	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Integrated Land and Resource Governance II (ILRG II), Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Integrated Land and Resource Governance II (ILRG II), Mitigation	0.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2022, Integrated Land and Resource Governance II (ILRG II), Mitigation, first	2.6	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Integrated Land and Resource Governance II (ILRG II), Mitigation, Forestry	0.31	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Bangladesh	2022, Integrated Local Health Systems Strengthening Activity, Adaptation - Climate Specific	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Integrated Natural Resource Management (INRM), Mitigation	0.15	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Integrated Natural Resource Management (INRM), Mitigation, first	9.7	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Integrated Natural Resource Management (INRM), Mitigation, fourth	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Tanzania	2022, Integrated Natural Resource Management (INRM), Mitigation, Tanzania	0.306	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2022, Integrated Natural Resource Management (INRM), Mitigation, third	0.85	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Zambia	2022, Integrated Natural Resource Management, Adaptation	0.225	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Integrated Natural Resources Management (INRM) FEWS NET Health Threat Extension Activity - Adaptation, Adaptation - Climate Specific	0.25	Committed	Regional	ODA	Grant	Adaptation	Other (Health)

Niger	2022, Integrated Water Management activity, Adaptation, Cross-Cutting	1.569	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Niger	2022, Integrated Water Management activity, Adaptation, Water and Sanitation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2022, Inter-Agency Agreement with the Centers for Disease Control and Prevention (CDC), Adaptation	0.125	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Interagency Climate Ambition Program Support, Mitigation, Cross-Cutting	3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Interagency Climate Ambition Program Support, Mitigation, Energy	3.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, International Conservation Programs, Mitigation	9	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Kenya	2022, International Federation of Red Cross and Red Crescent National Societies (IFRC) GH Umbrella PIO Grant, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, International Federation of the Red Cross and Red Crescent (IFRC), Adaptation	0.019	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Global	2022, International Methane Emissions Observatory, Mitigation	0.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, International Solar Alliance, Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Colombia	2022, Invest for Climate, Mitigation	3.1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Philippines	2022, Investing in Sustainability and Partnerships for Inclusive Growth and Regenerative Ecosystems (INSPIRE), Mitigation	1.6	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Iraq	2022, Iraq Advanced Evaluation and Learning, Adaptation, Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Iraq	2022, Iraq Advanced Evaluation and Learning, Mitigation, Mitigation	0.18	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Iraq	2022, Iraq Clean Energy Generation, Mitigation	8.53	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Iraq	2022, Iraq Governance Activity, Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2022, IRRI Rice Breeding Public-Private Partnership Platform Activity, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture

Global	2022, Island Led Resilience 2030, Adaptation	2.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Republic Of Palau, Federated States Of Micronesia, Republic Of The Marshall Islands	2022, Islands conservation, Mitigation	0.95	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Jamaica	2022, Jamaica food security, Mitigation- Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Jamaica	2022, Jamaica resilience, Mitigation	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Jamaica	2022, Jamaica resilience, Mitigation, first	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Asia Regional	2022, Japan-U.S.-Mekong Power Partnership (JUMPP), Mitigation	5	Committed	Regional	ODA	Grant	Mitigation	Energy
Uganda	2022, Jinja Regional Referral Hospital (JRRH) Strengthening Project, Adaptation	0.001	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Jinja Regional Referral Hospital (JRRH) Strengthening Project, Mitigation	0.002	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Jinja Regional Referral Hospital (JRRH) Strengthening Project, Mitigation, first	0.007	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Jordan	2022, Jordan nuclear energy, Mitigation	0.18	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Asia Regional	2022, Just and Equitable Workforce Transitions in South Asia, Mitigation, Cross-cutting	0.6	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Asia Regional	2022, Just and Equitable Workforce Transitions in South Asia, Mitigation, Energy	0.6	Committed	Regional	ODA	Grant	Mitigation	Energy
Europe & Eurasia Regional	2022, Just and Secure Energy Transition (J-SET) (formerly REMI), Adaptation	1.25	Committed	Regional	ODA	Grant	Adaptation	Energy
Europe & Eurasia Regional	2022, Just and Secure Energy Transition (J-SET) (formerly REMI), Mitigation	1.25	Committed	Regional	ODA	Grant	Mitigation	Energy
Europe & Eurasia Regional	2022, Just and Secure Energy Transition (J-SET), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Uganda	2022, Kabale Regional Referral Hospital Strengthening Project (KRRH), Adaptation	0.001	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Uganda	2022, Kabale Regional Referral Hospital Strengthening Project (KRRH), Mitigation	0.002	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Kabale Regional Referral Hospital Strengthening Project (KRRH), Mitigation, first	0.007	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Nepal	2022, Karnali Water Activity, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Kenya	2022, Kenya Conference of Catholic Bishops(KCCB) - Komesha TB program, Adaptation	0.102	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kenya	2022, Kenya Tuberculosis Support Program Follow on, Adaptation	0.139	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, Kenya Tuberculosis Support Program, Adaptation	0.645	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
West Bank and Gaza	2022, Khan Younis Wastewater Management and Reuse Activity, Adaptation	10	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Cambodia	2022, Khmer Water Supply Holding Co., Ltd., Adaptation	7	Committed	Bilateral	OOF	Concessional loan	Adaptation	Water and Sanitation
Kosovo	2022, Kosovo Adapt Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kosovo	2022, Kosovo Credit Guarantee Fund, Mitigation	7.5	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Cross-cutting
Kosovo	2022, Kosovo sustainable energy, Mitigation	142.7	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Niger	2022, Kulawa, Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Lacey Act Programs, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Forestry
Colombia	2022, Land for Prosperity, Mitigation	1.663	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Liberia	2022, Land Management Activity, Mitigation	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2022, Land Use Monitoring, Mitigation	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Laos	2022, Laos Energy Security Project, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, LDC Initiative for Effective Adaptation and Resilience (LIFE-AR), Adaptation	3.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
India	2022, Leap Agri Logistics (Balurghat), Adaptation	7.93	Committed	Bilateral	OOF	Concessional loan	Adaptation	Transport
India	2022, Leap Agri Logistics (Baroda), Adaptation	6.7	Committed	Bilateral	OOF	Concessional loan	Adaptation	Transport

Global	2022, LEAP Global, Adaptation	0.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Vietnam	2022, Learns Program, Adaptation	0.194	Committed	Bilateral	ODA	Grant	Adaptation	Other
Vietnam	2022, Learns Program, Mitigation	0.308	Committed	Bilateral	ODA	Grant	Mitigation	Other
Vietnam	2022, Learns Program, Mitigation, first	0.411	Committed	Bilateral	ODA	Grant	Mitigation	Other
Lebanon	2022, Lebanon Investment Initiative (LII), Mitigation, Cross-Cutting	1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Lebanon	2022, Lebanon Investment Initiative (LII), Mitigation, Energy	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Nepal	2022, Lentil Strengthening Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Lesotho	2022, Lesotho sustainable agriculture, Mitigation - Climate Specific	77.4	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Malawi	2022, Let Them Grow Healthy (Akule ndi Thanzi), Adaptation - Climate Specific	3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Guatemala	2022, Leveraging Economic Investment through Alliances, Adaptation	3.32	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Leveraging Embedded Finance Innovations to Accelerate Climate Solutions, Adaptation	0.6	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Leveraging Embedded Finance Innovations to Accelerate Climate Solutions, Adaptation, first	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Malawi	2022, Leveraging Local Capacity to Strengthen Health Service Delivery - Human Resource for Health (HRH #3) - Nutrition, Adaptation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Malawi	2022, Leveraging Local Capacity to Strengthen Health Service Delivery Project (LLCAP) - Human Resources for Health (HRH1), Adaptation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Malawi	2022, Leveraging Local Capacity to Strengthen Health Service Delivery Project (LLCAP) - Human Resources for Health (HRH2), Adaptation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Liberia	2022, Liberia Improved Access to Safe Drinking Water in Liberia, Adaptation	0.95	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Libya	2022, Libya Public Financial Management (LPFM), Mitigation	1.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Uganda	2022, Lira Regional Referral Hospital (LRRH) Strengthening Project, Adaptation	0.001	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Uganda	2022, Lira Regional Referral Hospital (LRRH) Strengthening Project, Mitigation	0.002	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Lira Regional Referral Hospital (LRRH) Strengthening Project, Mitigation, first	0.007	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Tanzania	2022, Lishe Mtambuka Activity, Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Other
Pakistan	2022, Livelihood and Food Security, Adaptation- Climate Specific	9	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Burma	2022, Livelihoods and Food Security Fund (LIFT) Multi-Donor Development Fund, Adaptation- Climate Specific- Climate Specific	2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Livelihoods Carbon Fund SICAV-RAIF, Mitigation	12.5	Committed	Multi-Bilateral	OOF	Loan guarantee	Mitigation	Cross-cutting
Peru, Colombia, Ecuador, Brazil, Guyana, Surinam	2022, Local Communications, Mitigation	0.15	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Liberia	2022, Local Empowerment for Accountability and Decentralization, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Burma	2022, Local Engagement and Development for TB (LEAD), Adaptation	0.407	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Libya	2022, Local Governance and Civil Society, Mitigation	0.35	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Bangladesh	2022, Local Health System Strengthening (LHSS) Activity, Adaptation - Climate Specific	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Tajikistan	2022, Local Health System Strengthening, Adaptation - Climate Specific	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kazakhstan	2022, Local Health System Sustainability, Adaptation - Climate Specific	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Jordan	2022, Local Health Systems Sustainability, Adaptation - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Jordan	2022, Local Health Systems Sustainability, Adaptation, first - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Tajikistan	2022, Local Impact, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Uganda	2022, Local Partner Health Services - Ankole and Acholi Regions, Adaptation - Climate Specific	0.005	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Uganda	2022, Local Partner Health Services - Ankole and Acholi Regions, Mitigation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services - Ankole and Acholi Regions, Mitigation, first - Climate Specific	0.035	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services - East Central, Adaptation - Climate Specific	0.003	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Local Partner Health Services - East Central, Mitigation - Climate Specific	0.006	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services - East Central, Mitigation, first - Climate Specific	0.021	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services – Eastern, Adaptation - Climate Specific	0.003	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Local Partner Health Services – Eastern, Mitigation - Climate Specific	0.006	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services – Eastern, Mitigation, first - Climate Specific	0.021	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services – Kigezi and Lango, Adaptation - Climate Specific	0.005	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Local Partner Health Services – Kigezi and Lango, Mitigation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services – Kigezi and Lango, Mitigation, first - Climate Specific	0.035	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services - Tuberculosis, Adaptation - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Local Partner Health Services - Tuberculosis, Mitigation - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Partner Health Services - Tuberculosis, Mitigation, first - Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Nepal	2022, Local Partnership Activity for Natural Resource Management and Climate Change, Adaptation, Agriculture-Climate Specific	1.193	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Nepal	2022, Local Partnership Activity for Natural Resource Management and Climate Change, Adaptation, Cross-cutting	1.1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting

Nepal	2022, Local Partnership Activity for Natural Resource Management and Climate Change, Adaptation, Energy	2	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Nepal	2022, Local Partnership Activity for Natural Resource Management and Climate Change, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, Local Service Delivery for HIV/AIDS Activity, Adaptation - Climate Specific	0.002	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Local Service Delivery for HIV/AIDS Activity, Mitigation - Climate Specific	0.004	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Local Service Delivery for HIV/AIDS Activity, Mitigation, first - Climate Specific	0.014	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, Local2030 Islands Network, Adaptation	1.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Madagascar	2022, Localization Activity - CCP: Conservation, Sustainable Development, and Governance, Mitigation	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Guinea	2022, Localize Global Health Security, Adaptation - Climate Specific	0.8	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, Logistic Support & Technical Assistance, Adaptation	0.616	Committed	Bilateral	OOF	Grant	Adaptation	Other
South Africa	2022, Loowatt TA, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2022, Low Emission Development Strategies Global Partnership (LEDS-GP), Mitigation	2.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Ethiopia	2022, Lowlands Health Activity, Adaptation - Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Luangwa Livelihood and Conservation, Adaptation	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Zambia	2022, Luangwa Livelihood and Conservation, Adaptation, first	0.17	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Zambia	2022, Luangwa Livelihood and Conservation, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Zambia	2022, Luangwa Livelihood and Conservation, Mitigation, first	0.45	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Egypt	2022, Macroeconomic Support, Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Rwanda	2022, Malaria Activity, Adaptation - Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, Malaria Diagnosis and Treatment Activity, Adaptation - Climate Specific	2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Malaria Reduction Activity, Adaptation - Climate Specific	0.195	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Malaria Reduction Activity, Mitigation - Climate Specific	0.39	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Malaria Reduction Activity, Mitigation, first - Climate Specific	1.365	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Malawi	2022, Malawi resilience, Adaptation	34.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Bangladesh	2022, Mamoni Maternal and Newborn Care Strengthening Project (MNCSP) Activity, Adaptation	0.9	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Madagascar	2022, Marine Activity - CCP: Conservation, Sustainable Development, and Governance, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Marine Seascape Activity, Adaptation	0.3	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Tajikistan	2022, Market Driven Rural Development Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Tajikistan	2022, Market Driven Rural Development Activity, Adaptation, first	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Tajikistan	2022, Market Driven Rural Development Activity, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Tajikistan	2022, Market Driven Rural Development Activity, Mitigation, first	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Tajikistan	2022, Market Driven Rural Development Activity, Mitigation, second	0.4	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Ghana	2022, Market Systems and Resilience Activity (MSR), Adaptation	1.05	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Bangladesh	2022, Marketing Innovations for Sustainable Health Development, Adaptation - Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Somalia	2022, Maternal Child Health - Activity, Adaptation - Climate Specific	0.155	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Mbale Regional Referral Hospital Strengthening Project (MbRRH), Adaptation	0.001	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Mbale Regional Referral Hospital Strengthening Project (MbRRH), Mitigation	0.002	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Mbale Regional Referral Hospital Strengthening Project (MbRRH), Mitigation, first	0.007	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, MCE Empowering Sustainable Agriculture Fund LLC, Adaptation- Climate Specific	10	Committed	Multi-Bilateral	OOF	Concessional loan	Adaptation	Agriculture
Mongolia	2022, Media and Civil Society Strengthening (MACSS), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2022, Medicine, Tech and Pharma Services Activity (MTaPS), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Medicines Quality Assurance Systems Strengthening Program (PQM+), Adaptation	0.075	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Medicines Quality Assurance Systems Strengthening Program (PQM+), Adaptation, Agriculture- Climate Specific	0.7	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Medicines Quality Assurance Systems Strengthening Program (PQM+), Adaptation, first	0.65	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Medicines Quality Assurance Systems Strengthening Program (PQM+), Adaptation, second	0.3	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Jordan	2022, Medicines, Technologies and Pharmaceutical Services (MTaPS)-Antimicrobial Resistance (AMR) Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Burkina Faso	2022, Medicines, Technologies, and Pharmaceutical Services (MTaPS), Adaptation	0.7	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Cameroon	2022, Medicines, Technologies, and Pharmaceutical Services, Adaptation	0.11	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Meeting Target and Maintaining Epidemic Control (TMEC) EpiC, Mitigation	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Ghana	2022, Meeting Targets and Maintaining Epidemic Control (EpiC), Adaptation, Ghana	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Honduras	2022, Meeting Targets and Maintaining Epidemic Control (EpiC), Adaptation, Honduras	0.168	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Pakistan	2022, Merged Areas Governance Program, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Methane Accelerator, Mitigation, Cross-Cutting	1.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Methane Accelerator, Mitigation, Energy	1.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Methane Pipeline Development, Mitigation, Cross-Cutting	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Methane Pipeline Development, Mitigation, Energy	0.5	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Methane Trust Fund, Mitigation, Cross-Cutting	1.6	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Methane Trust Fund, Mitigation, Energy	1.6	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Mexico	2022, Mexico food security, Mitigation, first- Climate Specific	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Mexico	2022, Mexico food security, Mitigation, second- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Mexico	2022, Mexico Mitigation and Forest Transparency, Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Mexico	2022, Mexico resilience, Mitigation	0.21	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Mexico	2022, Mexico solar-powered desalination, Mitigation	0.96	Committed	Bilateral	OOF	Export credit	Mitigation	Energy
Mexico	2022, Mexico sustainable agriculture, Mitigation- Climate Specific	0.07	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Mexico	2022, Mexico sustainable agriculture, Mitigation, third- Climate Specific	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Mexico	2022, Mexico water security, Mitigation	0.33	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Middle East Regional	2022, Middle East Climate Change Activity, Mitigation	0.18	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Middle East Regional	2022, Middle East Regional Cooperation (MERC) Inter Agency Agreement for Funding Small Grants, Adaptation	1.45	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Madagascar	2022, MIKAJY, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Philippines	2022, Mission Buy-in, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry

Global	2022, Mission Innovation, Mitigation	3.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2022, Mission Program Support, Adaptation	0.039	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2022, Mission Program Support, Mitigation	0.039	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Vietnam	2022, Mission-wide PD&L Activity, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Other
Africa Regional	2022, Mitigation Activity, Mitigation	0.202	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Indonesia	2022, Mitigation Program, Mitigation	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Other
Mexico	2022, Mitigation Ventures Activity, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Mexico	2022, Mitigation Ventures Activity, Mitigation, first	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Georgia	2022, Mobility and Operations for Verdant Economy Program, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Transport
Malawi	2022, Modern Cooking for Healthy Forests in Malawi - Tiphike Mwa Makono, Adaptation - Climate Specific	1.462	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Sudan	2022, Momentum - Integrated Health Resilience, Adaptation - Climate Specific	0.205	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Niger	2022, Momentum Private Healthcare Delivery, Adaptation - Climate Specific	0.7	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, MOMENTUM Country and Global Leadership (MCGL), Adaptation	1.107	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Momentum Integrated Health Resilience (MIHR), Adaptation - Climate Specific	1.23	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Momentum Integrated Health Resilience (MIHR), Adaptation, first - Climate Specific	1.246	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Niger	2022, Momentum Integrated Health Resilience (MIHR), Adaptation, Niger - Climate Specific	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Tanzania	2022, Momentum Integrated Health Resilience (MIHR), Mitigation - Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, MOMENTUM Routine Immunization Transformation and Equity's (MRITE), Adaptation, Agriculture- Climate Specific	2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, MOMENTUM Routine Immunization Transformation and Equity's (MRITE), Adaptation, Other (Health) - Climate Specific	0.764	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)

Yemen	2022, MOMENTUM Yemen Strengthening Health Access, Adaptation - Climate Specific	0.42	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Mongolia	2022, Mongolia Energy Governance (MEG), Mitigation	3	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2022, Monitoring, Evaluation and Learning Platform, Adaptation	0.06	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2022, Monitoring, Evaluation and Learning Platform, Mitigation	0.06	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
West Bank and Gaza	2022, Monitoring, Evaluation and Learning Services (MELS), Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
West Bank and Gaza	2022, Monitoring, Evaluation and Learning Services (MELS), Mitigation	0.35	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Morocco	2022, Morocco Climate Program, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Morocco	2022, Morocco Climate Program, Adaptation, first	3.8	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Cambodia	2022, Morodok Baitang, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Cambodia	2022, Morodok Baitang, Adaptation, first	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Other
Cambodia	2022, Morodok Baitang, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Cambodia	2022, Morodok Baitang, Mitigation, first	2	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Cambodia	2022, Morodok Baitang, Mitigation, Other	0.542	Committed	Bilateral	ODA	Grant	Mitigation	Other
Cambodia	2022, Morodok Baitang, Mitigation, second	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Uganda	2022, Moroto Regional Referral Hospital (MoRRH) Strengthening Project, Adaptation	0.001	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Moroto Regional Referral Hospital (MoRRH) Strengthening Project, Mitigation	0.002	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Moroto Regional Referral Hospital (MoRRH) Strengthening Project, Mitigation, first	0.007	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, Multinational Species Conservation Fund, Mitigation	31.369	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Mozambique	2022, Mvuvi Holdings, Adaptation	3.75	Committed	Bilateral	OOF	Concessional loan	Adaptation	Other (Fisheries, Marine, and Coastal)

Senegal	2022, MyAgro, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, National Adaptation Plan – Global Network (NAP-GN), Adaptation	2.5	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Ghana	2022, National Health Insurance Authority Systems Strengthening - Government to Government, Adaptation - Climate Specific	0.45	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Benin	2022, National Malaria Control Program (NMCP), Adaptation - Climate Specific	0.42	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Mexico	2022, National Renewable Energy Lab Field Support, Mitigation	0.15	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Cambodia, Indonesia, Laos, Malaysia, Burma, Philippines, Thailand, Vietnam	2022, Natural Climate Solutions ActivityPartnerships for Green Investment, Mitigation	1.84	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Peru	2022, Natural Infrastructure for Water Security NIWS Phase II, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Europe & Eurasia Regional	2022, Natural Resource Management, Adaptation	0.55	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Malawi	2022, NBS Bank, Mitigation	2.5	Committed	Bilateral	OOF	Loan guarantee	Mitigation	Cross-cutting
Global	2022, NDC Partnership, Mitigation, Cross-Cutting	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, NDC Partnership, Mitigation, Energy	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Argentina, Aruba, Bahamas, Belize, Bonaire, Canada, Chile, Columbia, Curacao, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, St. Eustatius, St. Maarten, Saba,	2022, Neotropical Migratory Bird Conservation Act Grants, Mitigation	3.985	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting

Suriname, United States, Venezuela								
Nepal	2022, Nepal Seed And Fertilizer Project (NSAF), Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Net Zero World Initiative, Mitigation	3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Dominican Republic	2022, New Climate Adaptation Program, Adaptation	5.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Kenya	2022, New FtF 3.0 Local Food Systems Activity, Adaptation-Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Kenya	2022, New FtF 3.0 Private Sector Activity, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, New Prosper Africa Trade and Investment Platform (ATI), Adaptation	0.55	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Cambodia	2022, Next Gen Procurement and Supply Chain Management, Adaptation	0.65	Committed	Bilateral	ODA	Grant	Adaptation	Other
Nigeria	2022, Nigeria batteries, Mitigation	8.71	Committed	Bilateral	OOF	Export credit	Mitigation	Energy
Nigeria	2022, Nigeria Clean Energy, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Peru	2022, NIWS Phase II, Adaptation	3.391	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Jordan	2022, Non-Revenue Water Phase IV, Adaptation	8	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Jordan	2022, Non-Revenue Water Phase IV, Adaptation, first	39	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Madagascar	2022, Nosy Manga, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Guinea	2022, Notre Santé, Mitigation	0.995	Committed	Bilateral	ODA	Grant	Mitigation	Other
Barbados, Dominican Republic, Haiti, Jamaica, Guyana	2022, NREL Cyber Security Program, Mitigation	0.13	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Nigeria	2022, Nutrition Activity, Adaptation	0.616	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Observing Ocean Warming-Argo, Adaptation	11.7	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries,

								Marine, and Coastal)
Ecuador	2022, Oceans Finance Company, Adaptation	800	Committed	Bilateral	OOF	Insurance	Adaptation	Water and Sanitation
Europe & Eurasia Regional	2022, Offshore Wind Energy Development, Mitigation	0.75	Committed	Regional	ODA	Grant	Mitigation	Agriculture
Asia Regional	2022, Omnivore Agritech & Climate Sustainability Fund 3, Adaptation	30	Committed	Regional	OOF	Equity	Adaptation	Cross-cutting
Africa Regional	2022, One Acre Fund TA, Adaptation	5	Committed	Regional	OOF	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, One Acre Fund, Adaptation	20	Committed	Regional	OOF	Concessional loan	Adaptation	Cross-cutting
Jamaica	2022, One Health coordination and emerging infectious disease (EID) surveillance implementation, Adaptation - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Uganda	2022, One Health Coordination Mechanism, Adaptation - Climate Specific	0.005	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, One Health Coordination Mechanism, Mitigation - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, One Health Coordination Mechanism, Mitigation, first - Climate Specific	0.035	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand, and Vietnam	2022, One Health Workforce - Next Generation, Adaptation - Climate Specific	0.495	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Philippines	2022, One Health Workforce-Next Generation (OHW-NG), Adaptation - Climate Specific	0.233	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, One Health Workforce-Next Generation, Adaptation - Climate Specific	0.005	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, One Health Workforce-Next Generation, Mitigation, - Climate Specific	0.01	Committed	Regional	ODA	Grant	Mitigation	Other (Health)

Zimbabwe	2022, One Health Workforce-Next Generation, Mitigation, Zimbabwe - Climate Specific	0.035	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
India	2022, Orb Energy II, Mitigation	20	Committed	Bilateral	OOF	Concessional loan	Mitigation	Energy
Egypt	2022, OSRA (Family), Adaptation	0.13	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2022, Our Fish Our Future, Adaptation	0.25	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Senegal	2022, Owod, Adaptation	3.7	Committed	Bilateral	ODA	Grant	Adaptation	Other
Asia Regional	2022, Pacific American Fund, Adaptation	1.302	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2022, Pacific American Fund, Adaptation, first	4.782	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Pacific Blue Bonds Program, Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Asia Regional	2022, Pacific Coastal Fisheries Management and Compliance Activity, Adaptation	0.148	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Zambia	2022, PAMO Plus, Adaptation	0.487	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Tanzania	2022, Pamoja Tuwekeze Afya (PATA), Mitigation	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other
Panama	2022, Panama food security, Mitigation- Climate Specific	0.21	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Panama	2022, Panama resilience, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting

Papua New Guinea	2022, Papua New Guinea Electrification Partnership, Mitigation	2.4	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Papua New Guinea	2022, Papua New Guinea Mitigation Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Papua New Guinea	2022, Papua New Guinea Mitigation Activity, Mitigation, first	2.541	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Paraguay	2022, Paraguay food security, Mitigation- Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Paraguay	2022, Paraguay forestry, Mitigation	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Paraguay	2022, Paraguay resilience, Mitigation	0.13	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Malawi	2022, Parliament Support Program (PSP), Adaptation	0.037	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Ghana	2022, Partnering to Build Community Capacity in Ghana, Adaptation	0.05	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Partnership for Decarbonized and Climate Resilient Energy Systems, Mitigation	1.1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Ghana	2022, Partnership for Inclusive Agricultural Transformation in Africa (PIATA), Adaptation	0.45	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Mexico	2022, Partnership for Net Zero Cities (PNZC), Mitigation	1.8	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Mexico	2022, Partnership for Net Zero Cities (PNZC), Mitigation, first	3.95	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Partnership for the Development of Eastern Congo (P-DEC), Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Forestry
Tajikistan	2022, PAS Democracy Commission Small Grants Programs and Democracy Outreach Grants, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Peace Corps Agriculture and Enviornment, Mitigation-Climate Specific	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Paraguay	2022, Peace Corps Small Project Assistance (SPA) on Mitigation, Mitigation	0.025	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Somalia	2022, People Centered Governance Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other
Peru	2022, Peru forestry, Mitigation	0.39	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Bangladesh	2022, Pharmaceutical Management and Supply Chain Systems Strengthening Activity, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Philippines	2022, Philippine Mitigation Activity, Mitigation	1.63	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting

Mozambique	2022, PLANETA, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Ghana	2022, PMI - Impact Malaria, Adaptation - Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, PMI - Revolve, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Guinea	2022, PMI Evolve, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Cameroon	2022, PMI Evolving Vector Control to Fight Malaria (PMI EVOLVE), Adaptation - Climate Specific	1.109	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, PMI Impact Malaria, Mitigation - Climate Specific	0.05	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Kenya	2022, PMI Kinga Malaria, Adaptation - Climate Specific	2.374	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Kenya	2022, PMI Kinga Malaria, Mitigation - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, PMI REACH Project, Mitigation	0.1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Global	2022, PMI Vector Control Central Mechanism, Mitigation	0.903	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Madagascar	2022, PMI VectorLink Project, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Papua New Guinea	2022, PNG Water Activity, Adaptation	1.246	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2022, Power Africa, Mitigation	0.1	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa, Mitigation, first	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa, Mitigation, second	0.95	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: African Legal Support Facility II (ALSF II), Mitigation	0.82	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: West Africa Energy Program (WAEP) IDIQ, Mitigation	1.65	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: West Africa Energy Program (WAEP) IDIQ, Mitigation, first	7.39	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: African Development Bank's Sustainable Energy Fund for Africa (SEFA), Mitigation	2.395	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: Clean Tech Energy Network (CTEN), Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Energy

Africa Regional	2022, Power Africa: Commercial Law Development Program (CLDP), Mitigation	0.95	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: Empower East and Central Africa (EECA), Mitigation	15.225	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: Empower Southern Africa (ESA), Mitigation, Cross-cutting	11.408	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Africa Regional	2022, Power Africa: Empower Southern Africa (ESA), Mitigation, Energy	0.35	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: Green Jobs for Women (GJW), Mitigation	0.5	Committed	Regional	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Power Africa: Health Electrification and Telecommunications Alliance (HETA), Mitigation - Climate Specific	3	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Nigeria	2022, Power Africa: Nigeria Power Sector Program (NPSP), Mitigation	2.822	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kazakhstan	2022, Power Central Asia, Mitigation, Kazakhstan	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Kazakhstan, Turkmenistan, Tajikistan, Kyrgyzstan, Uzbekistan	2022, Power Central Asia, Mitigation, Kazakhstan, Turkmenistan, Tajikistan, Kyrgyzstan, Uzbekistan	3.084	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Tajikistan	2022, Power Central Asia, Mitigation, Tajikistan	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Burma	2022, President's Malaria Initiative Eliminate Malaria (PMI-EM) Activity, Mitigation - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Other
Kenya	2022, Private Sector Engagement (PSE) Activity, Adaptation	0.011	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Procurement & Supply Management (PSM) - Malaria Task Order, Mitigation - Climate Specific	0.05	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Colombia	2022, Productive Ecosystems (Productive Nature), Adaptation	2.7	Committed	Bilateral	ODA	Grant	Adaptation	Other
Colombia	2022, Productive Ecosystems, Adaptation	3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2022, Program for Accelerated Control of TB in Karamoja (PACT Karamoja), Adaptation	0.015	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Program for Accelerated Control of TB in Karamoja (PACT Karamoja), Mitigation	0.03	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Program for Accelerated Control of TB in Karamoja (PACT Karamoja), Mitigation, first	0.105	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Antigua and Barbuda, Barbados, The Bahamas,	2022, Program for Accelerating Climate Change Adaptation in the Caribbean (5Cs), Adaptation	1.025	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Dominica, Grenada, Guyana, Saint Lucia, St. Kitts and Nevis, St. Vincent and The Grenadines, Suriname and Trinidad and Tobago								
Zambia	2022, Program for Advancing Supply Chain Outcomes (PASCO), Adaptation	0.015	Committed	Bilateral	ODA	Grant	Adaptation	Other
Zambia	2022, Program for Advancing Supply Chain Outcomes (PASCO), Adaptation, first	0.075	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Program for Local and Urban Sustainability (PLUS), Adaptation	0.4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Program for Local and Urban Sustainability (PLUS), Adaptation, second	0.935	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Program for Local and Urban Sustainability (PLUS), Mitigation	1.21	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Program for Locally-led Urban Sustainability (formerly Green Cities Activity), Mitigation	0.075	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Global	2022, Program for Locally-led Urban Sustainability (formerly Green Cities Activity), Mitigation, first	0.84	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Uzbekistan	2022, Program for Locally-led Urban Sustainability (PLUS) Activity, Adaptation, Cross-cutting	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Uzbekistan	2022, Program for Locally-led Urban Sustainability (PLUS) Activity, Adaptation, Other	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Asia Regional	2022, Program Funded Staff - Pacific Islands, Mitigation	0.465	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Georgia	2022, Program Support for DO 1, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Other
India	2022, Program to Strengthen Self Reliance and Resilience of Tibetan Communities in South Asia, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other
Bangladesh	2022, Programming Approach Guidance through Evidence and Research (PAGER), Adaptation	0.215	Committed	Bilateral	ODA	Grant	Adaptation	Other
Haiti	2022, Project Paysages Résilients - Nord, Mitigation	2.773	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Haiti	2022, Project Paysages Résilients - Sud, Mitigation	1.227	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Haiti	2022, Projet Paysages Résilients - Nord, Adaptation	6.836	Committed	Bilateral	ODA	Grant	Adaptation	Other

Haiti	2022, Projet Paysages Résilients - Sud, Adaptation	3.664	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Peru, Colombia, Ecuador, Brazil, Guyana, Surinam	2022, Promoting Nationally Determined Contributions (NDC), Mitigation	0.995	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Uzbekistan	2022, Promoting the Quality of Medicines Plus (PQM+), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Guinea	2022, Promoting the Quality of Medicines Plus (PQM+/USP), Mitigation	0.411	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Ghana	2022, Promoting the Quality of Medicines, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Democratic Republic Of The Congo	2022, Prosper Africa Trade and Investment - Constructing Competitive, Responsible Minerals Trade (CCRMT), Adaptation	1.815	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Guatemala	2022, Prosperous and Resilient Landscapes, Mitigation	4.88	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Public Private Partnerships for Climate Resiliency, Adaptation	0.4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Honduras	2022, Public Private Partnerships, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Ethiopia	2022, Quality Healthcare Activity, Adaptation - Climate Specific	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ghana	2022, Quality Services for Health, Adaptation - Climate Specific	1.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ghana	2022, Quality Services for Health, Mitigation - Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Madagascar	2022, RANO MAHARITRA, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
West Bank and Gaza	2022, Reduction of Non-Revenue Water in Southern West Bank Activity, Adaptation	2.8	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
West Bank and Gaza	2022, Reduction of Non-Revenue Water in Southern West Bank Activity, Adaptation, first	4	Committed	Bilateral	ODA	Grant	Adaptation	other
West Bank and Gaza	2022, Reduction of Non-Revenue Water in Southern West Bank Activity, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Asia Regional	2022, Regional - Human Rights and Climate Change, Adaptation	0.25	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Regional Adaptation Activity, Adaptation	2	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation

El Salvador, Guatemala, Honduras, Belize, Costa Rica, Panama	2022, Regional Clean Energy Activity, Mitigation	1.9	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
El Salvador, Guatemala, Honduras	2022, Regional Coastal Biodiversity Activity, Adaptation	0.095	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
El Salvador, Guatemala, Honduras	2022, Regional Coastal Biodiversity Activity, Adaptation, second	0.802	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
El Salvador, Guatemala, Honduras	2022, Regional Coastal Biodiversity Activity, Mitigation	0.048	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago	2022, Regional Energy Sector Reform Activity, Mitigation	0.35	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St.	2022, Regional Energy Sector Reform Activity, Mitigation, first	2.55	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy

Vincent and The Grenadines, Suriname, The Bahamas, and Trinidad and Tobago								
Africa Regional	2022, Regional Health Activity, Adaptation, Agriculture-Climate Specific	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Regional Health Activity, Adaptation, Other (Health) - Climate Specific	0.965	Committed	Regional	ODA	Grant	Adaptation	Other (Health)
Latin America & Caribbean Regional	2022, Regional LAC Rail Infrastructure Modernization Reverse Trade Mission, Mitigation	0.18	Committed	Regional	ODA	Grant	Mitigation	Transport
Africa Regional	2022, Regional Resilience TEV-Ag Follow-on, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Regional Resilience TEV-Ag Follow-on, Adaptation, Cross-cutting	2.607	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Regional Resilience TEV-Ag Follow-on, Adaptation, first	1	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Philippines	2022, Regulatory Reform Support Program for National Development (RESPOND), Adaptation	0.82	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Benin	2022, Reinforcement of Community Health - BUPDOS, Adaptation - Climate Specific	0.63	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Benin	2022, Reinforcement of Community Health - DEDRAS, Adaptation - Climate Specific	0.75	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Benin	2022, Reinforcement of Community Health - SIAN'SON, Adaptation - Climate Specific	0.81	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Uganda	2022, Renewable Energy Activity, Mitigation	0.7	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Tunisia	2022, Renewable Energy and Energy Efficiency (Power Tunisia), Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Tunisia	2022, Renewable Energy and Energy Efficiency (Power Tunisia), Mitigation, first	3.5	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Renewable energy exports, Mitigation	29	Committed	Multi-Bilateral	OOF	Export credit	Mitigation	Energy
Republic Of Congo	2022, Republic of Congo Conservation Enterprise Activity, Mitigation	0.25	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Antigua and Barbuda, Barbados, The Bahamas, Dominica, Grenada,	2022, RESET, Adaptation	2.4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Guyana, Saint Lucia, St. Kitts and Nevis, St. Vincent and The Grenadines, Suriname and Trinidad and Tobago								
Asia Regional	2022, Resilience and Adaptation Fellowship Program for Rising Leaders, Adaptation	5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Resilience and Adaptation Mainstreaming Project (RAMP), Adaptation	2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Resilience in agriculture, Adaptation- Climate Specific	59.218	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Ethiopia	2022, Resilience in Pastoral Areas- North, Adaptation	0.867	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ethiopia	2022, Resilience in Pastoral Areas- North, Adaptation, first	1.134	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ethiopia	2022, Resilience in Pastoral Areas- South, Adaptation	0.77	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ethiopia	2022, Resilience in Pastoral Areas- South, Adaptation, first	1.938	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Resilience Through Accelerating New Community-Based Holistic Outcomes for Resource Sustainability, Adaptation	1.6	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Resilient Cities, Adaptation	0.47	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2022, Resilient Cities, Adaptation, Cross-Cutting	2	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Resilient Cities, Adaptation, first	1.25	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Mozambique	2022, Resilient Coastal Communities, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Mozambique	2022, Resilient Coastal Communities, Adaptation, first	2.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine,

								and Coastal)
Georgia	2022, Resilient Communities Program, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Mozambique	2022, Resilient Gorongosa, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, Resilient Waters Program, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Georgia	2022, Resort Abastumani Sanatorium Arazindo LLC, Mitigation	0.43	Committed	Bilateral	OOF	Concessional loan	Mitigation	Cross-cutting
Africa Regional	2022, Resource Management, Mitigation	1.435	Committed	Regional	ODA	Grant	Mitigation	Forestry
Global	2022, responsAbility Climate Smart Agriculture Fund TA Facility, Adaptation- Climate Specific	1	Committed	Multi-Bilateral	OOF	Grant	Adaptation	Cross-cutting
Colombia	2022, Responsive Governance, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, Res-WASH Activity, Adaptation, Agriculture- Climate Specific	0.92	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Uganda	2022, Res-WASH Activity, Adaptation, Water and Sanitation	5	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2022, RFS Transfer, Mitigation	0.3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Africa Regional	2022, RMEL Activity for the Regional Economic Growth Office (Follow-on to ASSESS), Adaptation	0.099	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Root Capital TA, Adaptation	5	Committed	Multi-Bilateral	OOF	Grant	Adaptation	Other
Global	2022, Root Capital, Inc., Adaptation	35	Committed	Multi-Bilateral	OOF	Loan guarantee	Adaptation	Other
Guatemala	2022, Rural Clean Energy Activity, Mitigation	2.006	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Moldova	2022, Rural Competitiveness and Resilience Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Philippines	2022, Safe Water, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Philippines	2022, Safe Water, Mitigation	0.7	Committed	Bilateral	ODA	Grant	Mitigation	Water and Sanitation

Global	2022, Safeguarding the Future: Promoting Gender Equity and Equality and Action Through Seed Banks and Nurseries, Adaptation	1.2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, Sahel Collaboration and Communications (SCC), Adaptation	0.1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Niger	2022, Sahel Collaboration and Communications (SCC), Adaptation, Niger	0.074	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Niger	2022, Sahel Human Voice in Governance Activity (SHIGA), Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, Scaling Climate Action by Lowering Emissions (SCALE), Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Global	2022, Scaling Climate Action by Lowering Emissions (SCALE), Mitigation, first	9.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Kenya	2022, Scaling Sustainability and Resilience of Community Conservancies in Northern Rangelands and Coastal Ecosystems of Kenya, Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Kenya	2022, Scaling Sustainability and Resilience of Community Conservancies in Northern Rangelands and Coastal Ecosystems of Kenya, Adaptation, first	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Kenya	2022, Scaling Sustainability and Resilience of Community Conservancies in Northern Rangelands and Coastal Ecosystems of Kenya, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Zambia	2022, Scaling Up Nutrition Learning and Evaluation (SUN L&E), Adaptation	0.056	Committed	Bilateral	ODA	Grant	Adaptation	Other
Global	2022, Scaling Up Renewable Energy (SURE) II Task Order, Mitigation	0.75	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Colombia	2022, Scaling Up Renewable Energy II (SURE II), Mitigation	1.4	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2022, SDG Investment Fund S.A., SICAV-RAIF (Junior), Adaptation	20	Committed	Regional	OOF	Concessional loan	Adaptation	Cross-cutting
Africa Regional	2022, SDG Investment Fund S.A., SICAV-RAIF (Senior), Mitigation	20	Committed	Regional	OOF	Concessional loan	Mitigation	Cross-cutting
Georgia	2022, Securing Georgia's Energy Future Program, Mitigation	2.2	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Bangladesh	2022, Security Safety and Logistical Support Activity, Adaptation	0.026	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting

Bangladesh	2022, Security Safety and Logistical Support Activity, Mitigation	0.026	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Mali	2022, Sene Yiriwa Mopti/Timbucktu Agr Prod Sustainable Intensification of Target Value Chain, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Senegal	2022, Senegal solar, Mitigation	5.53	Committed	Bilateral	OOF	Export credit	Mitigation	Energy
Europe & Eurasia Regional	2022, Serbia Better Energy Activity, Mitigation	2	Committed	Regional	ODA	Grant	Mitigation	Energy
Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama	2022, SERVIR , Adaptation	1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Peru, Colombia, Brazil	2022, SERVIR Amazonia (Follow-on), Mitigation	1.332	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama	2022, SERVIR Central America Hub Establishment (Phase 3), Adaptation	0.192	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama	2022, SERVIR Central America Hub Establishment (Phase 3), Adaptation, first	1.1	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2022, SERVIR Southeast Asia, Adaptation	2	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, SERVIR WA 2, Adaptation	1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, SERVIR WA 2, Adaptation, first	1.1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Africa Regional	2022, SERVIR WA 2, Mitigation, Agriculture- Climate Specific	0.8	Committed	Regional	ODA	Grant	Mitigation	Agriculture
Africa Regional	2022, SERVIR WA 2, Mitigation, Forestry	0.5	Committed	Regional	ODA	Grant	Mitigation	Forestry
Africa Regional	2022, SERVIR West Africa 2 (Follow-on to SERVIR WA), Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Benin, Botswana, Burkina Faso, Burundi, Cabo	2022, SERVIR, Mitigation	1.77	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting

Verde, Chad, Côte D'Ivoire, Djibouti, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Togo, Tanzania, Uganda, Zambia								
Bangladesh	2022, SHOUHARDO III Plus, Adaptation	1.75	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Europe & Eurasia Regional	2022, Small Modular Reactor Regulations and Civil Nuclear Energy Standards Workshop, Mitigation	0.15	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2022, Small Project Assistance (SPA), Adaptation,	0.022	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Fiji, Samoa, Tonga, Vanuatu	2022, Small Project Assistance (SPA), Adaptation, Fiji, Samoa, Tonga, Vanuatu	0.241	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Small Projects Assistance (SPA) Program - Environment, Adaptation, Cross-Cutting	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Small Projects Assistance (SPA) Program - Environment, Adaptation, Other	0.62	Committed	Bilateral	ODA	Grant	Adaptation	Other
Nigeria	2022, Small Town WASH, Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Uganda	2022, Social and Behavior Change Activity (SBCA), Adaptation	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Niger	2022, SOILS consortium, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Asia Regional	2022, South Asia Group for Energy (SAGE) 2.0, Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2022, South Asia Regional Energy Program (SAREP), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2022, South Asia Regional Energy Program (SAREP), Mitigation, first	6.8	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2022, South Asia Regional Energy Program (SAREP), Mitigation, second	3.9	Committed	Regional	ODA	Grant	Mitigation	Energy

Asia Regional	2022, South Asia Regional Power Sector Development, Mitigation	0.8	Committed	Regional	ODA	Grant	Mitigation	Energy
Europe & Eurasia Regional	2022, South Caucasus Energy Partnership, Mitigation	3	Committed	Regional	ODA	Grant	Mitigation	Energy
Asia Regional	2022, South Pacific Tuna Treaty Economic Assistance Agreement (Climate), Adaptation	5	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Asia Regional	2022, South Pacific Tuna Treaty Economic Assistance Agreement, Adaptation	9	Committed	Regional	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Vietnam	2022, Southeast Asia Commercial Joint Stock Bank, Mitigation	20	Committed	Bilateral	OOF	Concessional loan	Mitigation	Cross-cutting
Philippines	2022, Southeast Asia One Health University Network (SEAOHUN) Transition Award, Adaptation - Climate Specific	0.068	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Brunei, Cambodia, Indonesia, Laos, Malaysia, Burma, Philippines, Thailand, Singapore, Vietnam	2022, Southeast Asian Fisheries Partnership, Adaptation	0.06	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Agriculture
Mexico	2022, Southern Mexico - Generating Employment and Sustainability (SURGES), Mitigation	1.2	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Peru	2022, Special Project Control and Reduction of Coca Crops and Tactic Anti-drug Operations in Upper Huallaga Valley, Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Other
Peru	2022, Specialty Coffee Community Project, Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Kenya	2022, Stawisha Pwani- FP/RMNCAH & Nutrition (Kwale County), Adaptation	1.535	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, Strategic Information Technical Support Project (SITES), Adaptation	0.015	Committed	Bilateral	ODA	Grant	Adaptation	Other

Uganda	2022, Strategic Information Technical Support Project (SITES), Mitigation	0.03	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, Strategic Information Technical Support Project (SITES), Mitigation, first	0.105	Committed	Bilateral	ODA	Grant	Mitigation	Other
Liberia	2022, Strategies to Prevent (STOP) Spillover, Adaptation, Liberia	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Seirra Leone	2022, Strategies to Prevent (STOP) Spillover, Adaptation, Seirra Leone	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Bangladesh	2022, Strategies to Prevent Spillover (STOP Spillover), Adaptation, Bangladesh	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Cambodia	2022, Strategies to Prevent Spillover (STOP Spillover), Adaptation, Cambodia	0.655	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, Strategies to Prevent Spillover (STOP Spillover), Adaptation, Uganda	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, Strategies to Prevent Spillover (STOP Spillover), Mitigation	0.02	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, Strategies to Prevent Spillover (STOP Spillover), Mitigation, first	0.07	Committed	Bilateral	ODA	Grant	Mitigation	Other
Solomon Islands	2022, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Natural Resources Management (NRM), Mitigation- Climate Specific	5.535	Committed	Bilateral	ODA	Grant	Mitigation	other
Egypt	2022, Strengthening Egypt's Global Health Security, Adaptation - Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Nigeria	2022, Strengthening Governance of Global Health Security, Adaptation - Climate Specific	0.616	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Seirra Leone	2022, Strengthening Integrated Health Services Activity (SIHSA), Adaptation - Climate Specific	0.83	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
India	2022, Strengthening Landscape Management and Conservation, Adaptation	1.3	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Democratic Republic Of The Congo	2022, Strengthening Livelihoods and Resilience Activity (SLR), Adaptation	1.319	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Indonesia	2022, Strengthening National Capacity to Prevent and Control Emerging and Re-emerging Pandemic Threats, Adaptation	2.9	Committed	Bilateral	ODA	Grant	Adaptation	Other

Asia Regional	2022, Strengthening Natural Resources Safeguards in Asia, Mitigation	0.325	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Laos	2022, Strengthening Public Transparency and Financial Management System, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Laos	2022, Strengthening Public Transparency and Financial Management System, Mitigation, first	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Uganda	2022, Strengthening Supply Chain Systems (SSCS), Adaptation	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Africa Regional	2022, Strengthening Supply Chain Systems (SSCS), Mitigation,	0.04	Committed	Regional	ODA	Grant	Mitigation	Other
Zambia	2022, Strengthening Supply Chain Systems (SSCS), Mitigation, Zambia	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Other
Nepal	2022, Strengthening Systems for Better Health (SSBH), Adaptation - Climate Specific	1	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Colombia	2022, Strengthening Together Activity, Mitigation	0.131	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Vietnam	2022, Strengthening Vietnam's International Health Regulations (2005) Core Capacities to Detect, Assess and Respond to Public Health Emergencies, Adaptation - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Nepal	2022, Suaahara II (Integrated Nutrition Program II), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Subnational Climate Action Leaders' Exchange, Mitigation	0.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, Subnational Climate Action Leaders' Exchange, Mitigation, first	0.8	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Mali	2022, Sugu Yiriwa Market Syst-Impr Delivery of Quality Products and Service Mopti/Timbuktu, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Antigua and Barbuda, Argentina, Aruba, The Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador,	2022, Summit-ESF, Adaptation	4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting

Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Martin, St. Vincent and Grenadines, Suriname, Trinidad and Tobago, Uruguay, and Venezuela								
Africa Regional	2022, SunFinder Solar Energy Transformation Fund, Mitigation	9.75	Committed	Regional	OOF	Insurance	Mitigation	Energy
Global	2022, Supply Chain Data Improvement Activity, Adaptation	0.501	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Ethiopia	2022, Supply Chain Improvement Program (SCHIP), Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Supply Chain Technical Assistance, Mitigation	0.125	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other
Serbia	2022, Support Services, Adaptation	0.093	Committed	Bilateral	ODA	Grant	Adaptation	Energy
Serbia	2022, Support Services, Mitigation	0.093	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Africa Regional	2022, Support to CILSS, Adaptation	0.3	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Support to CILSS, Adaptation, first	0.7	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Asia Regional	2022, Support to Coalition for Disaster Resilient Infrastructure, Adaptation	1.2	Committed	Regional	ODA	Grant	Adaptation	Other
Syria	2022, Supporting Livelihoods in Syria, Adaptation, Agriculture-Climate Specific	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Syria	2022, Supporting Livelihoods in Syria, Adaptation, Cross-Cutting	2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Ethiopia	2022, Surveillance for Malaria Elimination, Adaptation - Climate Specific	1.9	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Ecuador	2022, Sustainable Activities for Conservation of a Healthy Amazon (SACHA), Mitigation - Climate Specific	1.104	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Colombia	2022, Sustainable Agriculture, Adaptation- Climate Specific	0.988	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Colombia	2022, Sustainable Agriculture, Adaptation, first- Climate Specific	2.25	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture

Colombia	2022, Sustainable Agriculture, Adaptation, third- Climate Specific	1.6	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Colombia	2022, Sustainable Agriculture, Mitigation, Colombia- Climate Specific	5.048	Committed	Bilateral	ODA	Grant	Mitigation	other
Latin America & Caribbean Regional	2022, Sustainable agriculture, Mitigation, Regional- Climate Specific	0.13	Committed	Regional	ODA	Grant	Mitigation	Agriculture
Colombia	2022, Sustainable Economic Territorial Transformation (SETT), Adaptation	1.56	Committed	Bilateral	ODA	Grant	Adaptation	Other
Indonesia	2022, Sustainable Energy for Indonesia's Advancing Resilience (SINAR), Mitigation	7	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Ecuador	2022, Sustainable Environment and Livelihoods for a Vital Amazon (SELVA), Mitigation	1.651	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Indonesia	2022, Sustainable Environmental Governance Across Regions - SEGAR, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Indonesia	2022, Sustainable Environmental Governance Across Regions - SEGAR, Mitigation, Cross-Cutting	4.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Indonesia	2022, Sustainable Environmental Governance Across Regions - SEGAR, Mitigation, Forestry	1.65	Committed	Bilateral	ODA	Grant	Mitigation	Forestry
Vietnam	2022, Sustainable Forest Management (SFM), Mitigation	4.217	Committed	Bilateral	ODA	Grant	Mitigation	other
Global	2022, Sustainable Forests and Agricultural Commodity Trade, Mitigation	2	Committed	Multi-Bilateral	ODA	Grant	Mitigation	other
Philippines	2022, Sustainable Interventions for Biodiversity, Oceans, and Landscapes (SIBOL), Adaptation	0.7	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Philippines	2022, Sustainable Interventions for Biodiversity, Oceans, and Landscapes (SIBOL), Mitigation	0.76	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Brazil	2022, Sustainable livelihoods, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2022, Sustainable livestock, Mitigation	0.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Agriculture
Kenya	2022, Sustainable management of Tsavo and Amboseli landscapes for resilient communities and ecosystems, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Kenya	2022, Sustainable management of Tsavo and Amboseli landscapes for resilient communities and ecosystems, Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Forestry

Mexico	2022, Sustainable Prosperous Communities (SPC), Mitigation	8.513	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Africa Regional	2022, Sustainable Shea Initiative, Adaptation	0.25	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Peru	2022, Sustainable Value Chains, Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Kenya	2022, Sustainable, Transformational and Accessible Water Interventions (STAWI) Activity, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Global	2022, Sustaining Technical and Analytic Resources (STAR), Adaptation	0.063	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Uganda	2022, Sustaining Technical and Analytical Resources (STAR) Follow-on, Adaptation	0.002	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, Sustaining Technical and Analytical Resources (STAR) Follow-on, Mitigation	0.004	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, Sustaining Technical and Analytical Resources (STAR) Follow-on, Mitigation, first	0.014	Committed	Bilateral	ODA	Grant	Mitigation	Other
Global	2022, Systematic Observations Fin. Facility, Adaptation	13.6	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Tajikistan	2022, Tajikistan Evaluation and Analysis Activity (TEAA), Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Tajikistan	2022, Tajikistan Evaluation and Analysis Activity (TEAA), Mitigation	0.1	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Asia Regional	2022, Task Force on Nature-Related Financial Disclosures, Adaptation	0.2	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, Task Force on Nature-Related Financial Disclosures, Mitigation	0.185	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Asia Regional	2022, Task Force on Nature-Related Financial Disclosures, Mitigation, first	0.2	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Nepal	2022, Tayar Nepal - Improved Disaster Risk Management Project, Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Other
Nepal	2022, Tayar Nepal - Improved Disaster Risk Management Project, Adaptation, first	2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Zambia	2022, TB Elimination (TBLON Bridge), Adaptation	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, TB Elimination (TBLON Bridge), Adaptation, first	0.354	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Nigeria	2022, TB Local Organization Network (TBLON) Region 1&2, Adaptation	0.22	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Nigeria	2022, TB Local Organization Network (TBLON) Region 3, Adaptation	0.147	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, TB Local Organizations Network (TB LON), Adaptation	0.354	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
South Africa	2022, TB Local Organizations Network Project (TB LON), Adaptation	2.425	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Burma	2022, TB/HIV Agency, Information and Services (AIS), Adaptation - Climate Specific	0.917	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Brazil	2022, TechMet, Mitigation	30	Committed	Bilateral	OOF	Equity	Mitigation	Industry
Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Technical Assistance Activity, Mitigation	2.67	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Forestry
Global	2022, Technical Assistance and Mission Support (TAMS), Adaptation	0.05	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Thailand	2022, Technical assistance to strengthen malaria surveillance and the use of strategic information for malaria programming, Adaptation - Climate Specific	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Madagascar	2022, Terrestrial Activity - CCP: Conservation, Sustainable Development, and Governance, Adaptation	0.35	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Madagascar	2022, Terrestrial Activity - CCP: Conservation, Sustainable Development, and Governance, Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Indonesia	2022, The Collaborative Fisheries Management - Bersama Kelola Perikanan (Ber-IKAN), Adaptation	0.36	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine, and Coastal)
Tajikistan	2022, The Demographic and Health Surveys Program (DHS), Adaptation - Climate Specific	0.16	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Peru	2022, The Discovery & Exploration of Emerging Pathogens - Viral Zoonoses (DEEP VZN), Adaptation	0.61	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Zambia	2022, The Eastern Kafue Alliance for Nature and Prosperity - Health, Ecosystems and Agriculture for Resilient, Thriving Societies (HEARTH), Adaptation- Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Zambia	2022, The Eastern Kafue Alliance for Nature and Prosperity - Health, Ecosystems and Agriculture for Resilient, Thriving Societies (HEARTH), Adaptation, first- Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Zambia	2022, The Eastern Kafue Alliance for Nature and Prosperity, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Zambia	2022, The Eastern Kafue Alliance for Nature and Prosperity, Mitigation, first	0.4	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Egypt	2022, The Food and Agriculture Organization (FAO) - Global Health Security Project, Adaptation- Climate Specific	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Egypt	2022, The Learning Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Zambia	2022, The Luangwa Protecting Nature Improving Lives - Health, Ecosystems and Agriculture for Resilient, Thriving Societies (HEARTH) Global Development Alliance, Mitigation-Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Asia Regional	2022, The Pacific Community (SPC), Adaptation	0.301	Committed	Regional	ODA	Grant	Adaptation	Other
Africa Regional	2022, The Shade-grown Cocoa Activity, Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Forestry
Kenya	2022, Third Party Monitoring (TPM)/Afya Uwazi, Adaptation	0.007	Committed	Bilateral	ODA	Grant	Adaptation	Other
Timor-Leste	2022, Timor-Leste water, sanitation and drainage, Adaptation	15.2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Tunisia	2022, Tourism Development Project In Tunisia (Visit Tunisia), Mitigation	0.9	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Nepal	2022, Trade and Competitiveness (Udhyam Nepal), Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Lebanon	2022, Trade and Investment Facilitation Activity (TIF), Mitigation	2	Committed	Bilateral	ODA	Grant	Mitigation	Agriculture
Zambia	2022, Trade Boost, Adaptation	1.8	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Dominican Republic	2022, Transboundary Oceans Plastics/Solid Waste Management (SWM), Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Fisheries, Marine,

								and Coastal)
Honduras	2022, Transforming Market Systems, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Rwanda	2022, Transforming Rwanda Medical Supply Chain Activity (TRMS), Adaptation	0.36	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Peru	2022, Transforming the VRAEM: The Land of Fine Flavor Cacao, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Global	2022, Transparency Accelerator, Mitigation	3	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-cutting
Asia Regional	2022, Trees Outside Forests in India, Mitigation	3	Committed	Regional	ODA	Grant	Mitigation	Forestry
Africa Regional	2022, Triple Nexus (Climate, Gender, Fragility), Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Tanzania	2022, Tuhifadhi Maliasili (“Preserve Natural Resources”), Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2022, Tuhifadhi Maliasili (“Preserve Natural Resources”), Mitigation	0.5	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Tanzania	2022, Tumaini Kupitia Vitendo (TKV) Activity , Adaptation	0.4	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2022, Tumaini Kupitia Vitendo (TKV) Activity , Adaptation, first	2	Committed	Bilateral	ODA	Grant	Adaptation	Other
Tanzania	2022, Tumaini Kupitia Vitendo (TKV) Activity , Mitigation	0.494	Committed	Bilateral	ODA	Grant	Mitigation	Other
Uganda	2022, U.N. Food and Agricultural Organization, Adaptation-Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uganda	2022, U.N. Food and Agricultural Organization, Mitigation, Cross-cutting- Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Cross-cutting
Uganda	2022, U.N. Food and Agricultural Organization, Mitigation, Other- Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Other
India	2022, U.S.-India Strategic Clean Energy Partnership, Mitigation	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Uganda	2022, Uganda Health Activity, Adaptation - Climate Specific	0.203	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Uganda Health Activity, Mitigation - Climate Specific	0.406	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Uganda Health Activity, Mitigation, first - Climate Specific	1.421	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Uganda Health Systems Strengthening Project (UHSSP), Adaptation - Climate Specific	0.005	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Uganda	2022, Uganda Health Systems Strengthening Project (UHSSP), Mitigation - Climate Specific	0.035	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Uganda Health Systems Strengthening Project (UHSSP), Mitigation, Uganda - Climate Specific	0.01	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Uganda Maternal Child Health and Nutrition (MCHN) Activity, Adaptation - Climate Specific	0.02	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Uganda Maternal Child Health and Nutrition (MCHN) Activity, Mitigation - Climate Specific	0.04	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Uganda	2022, Uganda Maternal Child Health and Nutrition (MCHN) Activity, Mitigation, first - Climate Specific	0.14	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Tanzania	2022, Uhuru - TB & FP LON Facility, Mitigation	0.2	Committed	Bilateral	ODA	Grant	Mitigation	Other
Ukraine	2022, Ukraine nuclear energy, Mitigation	0.17	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Jordan, Morocco	2022, Ultra-Low Energy Drip Irrigation for MENA Countries, Mitigation	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Global	2022, UNICEF MCH Umbrella Grant II, Adaptation	0.157	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other
Philippines	2022, Urban Connect, Adaptation	0.25	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Philippines	2022, Urban Connect, Adaptation, first	1.81	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Bangladesh	2022, Urban Health Activity, Adaptation - Climate Specific	0.075	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, URBAN WASH, Mitigation	0.1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Nepal	2022, Urja Nepal, Mitigation	3.8	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Uzbekistan	2022, Uzbekistan: Market Systems Transformed, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other
Uzbekistan	2022, UzHydromet program, Adaptation	0.45	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Ethiopia	2022, Vector Link Project, Adaptation	3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Vector Link, Adaptation	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Uganda	2022, Vector Link, Mitigation	0.6	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)

Uganda	2022, Vector Link, Mitigation, first	2.1	Committed	Bilateral	ODA	Grant	Mitigation	Other (Health)
Zambia	2022, Vectorlinks, Adaptation	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Cross-cutting
Guatemala	2022, Verapaces, Mitigation	0.3	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Vietnam	2022, Vietnam Air Traffic Management Corporation (VATM) Weather Pilot Technical Assistance, Adaptation	1.06	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Vietnam	2022, Vietnam Low Emission Energy Program (VLEEP II), Mitigation	6.289	Committed	Bilateral	ODA	Grant	Mitigation	Transport
Egypt	2022, Virtuo Finance SARL, Mitigation	50	Committed	Bilateral	OOF	Concessional loan	Mitigation	Energy
Africa Regional	2022, Virunga Development Activity, Mitigation	0.673	Committed	Regional	ODA	Grant	Mitigation	Forestry
Afghanistan	2022, Wash Activity, Adaptation, Afghanistan	1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Rwanda	2022, WASH Activity, Adaptation, Rwanda	1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Mali	2022, WASH Anka Jiko, Adaptation	6.81	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Global	2022, WASHPaLS #2, Mitigation, Agriculture- Climate Specific	1.193	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Agriculture
Global	2022, WASHPaLS #2, Mitigation, Water and Sanitation	1.95	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Water and Sanitation
Iraq	2022, Water & Energy for Food (WE4F), Mitigation- Climate Specific	1	Committed	Bilateral	ODA	Grant	Mitigation	Energy
Egypt	2022, Water Adaptation, Adaptation	7	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Asia Regional	2022, Water and Vulnerable Environment program, Adaptation	0.3	Committed	Regional	ODA	Grant	Adaptation	Other
Kazakhstan, Turkmenistan, Tajikistan, Kyrgyzstan, Uzbekistan	2022, Water and Vulnerable Environment, Adaptation	4	Committed	Multi-Bilateral	ODA	Grant	Adaptation	other
Jordan	2022, Water Efficiency and Conservation Activity, Adaptation	4	Committed	Bilateral	ODA	Grant	Adaptation	other
Jordan	2022, Water Efficiency and Conservation Activity, Adaptation, first	4	Committed	Bilateral	ODA	Grant	Adaptation	other

Madagascar	2022, Water for Climate Migrants - Adaptation, Adaptation	0.6	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Jordan	2022, Water Governance Activity, Adaptation	2	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Jordan	2022, Water Governance Activity, Adaptation, first	2.27	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Senegal	2022, Water Management Activity, Adaptation	1.105	Committed	Bilateral	ODA	Grant	Adaptation	Water and sanitation
Lebanon	2022, Water Sanitation and Conservation (WSC) Activity, Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Lebanon	2022, Water Sanitation and Conservation (WSC) Activity, Mitigation	5	Committed	Bilateral	ODA	Grant	Mitigation	other
Philippines	2022, Water Security Activity, Adaptation	0.5	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Mexico	2022, Water Technologies Reverse Trade Mission, Adaptation	0.31	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2022, Water, Sanitation and Hygiene Finance (WASH-FIN) 2.0 Activity, Adaptation	0.5	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2022, Water, Sanitation and Hygiene Finance (WASH-FIN) 2.0 Activity, Adaptation, first	0.935	Committed	Regional	ODA	Grant	Adaptation	Water and Sanitation
India	2022, Water, Sanitation and Hygiene Finance (WASH-FIN), Adaptation	0.1	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Nepal	2022, Water, Sanitation, and Hygiene (WASH), Adaptation	0.825	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Nigeria	2022, Watershed Management for Source Water Protection - NPI, Adaptation	0.55	Committed	Bilateral	ODA	Grant	Adaptation	Water and Sanitation
Africa Regional	2022, Weather and Climate Information Services Activity, Adaptation	2.936	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Africa Regional	2022, West Africa Biodiversity and Low Emissions Development (WABiLED), Mitigation	0.3	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Africa Regional	2022, West Africa Biodiversity and Low Emissions Development (WABiLED), Mitigation, first	1.906	Committed	Regional	ODA	Grant	Mitigation	Cross-cutting
Africa Regional	2022, West Africa Biodiversity and Low Emissions Development (WABiLED), Mitigation, Other	0.25	Committed	Regional	ODA	Grant	Mitigation	Other

Nigeria	2022, West Africa Trade and Investment Hub Activity, Adaptation	0.825	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Argentina, Belize, Chile, Colombia, Costa Rica, Guatemala, Honduras, Mexico, Panama, Peru and Paraguay	2022, Western Hemisphere conservation, Mitigation	6.4	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Global	2022, WHO Consolidated Grant 2, Adaptation	0.15	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, WHO Polio II, Adaptation	12	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, WHO Umbrella Agreement - Consolidated II, Adaptation	0.44	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, WHO Umbrella Agreement - Consolidated II, Mitigation	0.25	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Other (Health)
Indonesia	2022, Wildlife trafficking, peat and mangrove restoration programs , Adaptation	1	Committed	Bilateral	ODA	Grant	Adaptation	Cross-Cutting
Global	2022, WMO/Systematic Observations Fin. Facility, Adaptation	13.6	Committed	Multi-Bilateral	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, Women Energy Leaders (WEL), Mitigation	1	Committed	Regional	ODA	Grant	Mitigation	Cross-Cutting
Africa Regional	2022, Women Shellfishers and Food Security Activity, Mitigation- Climate Specific	1	Committed	Regional	ODA	Grant	Mitigation	Other (Fisheries, Marine, and Coastal)
Asia Regional	2022, Workers' Rights in Just Transition, Adaptation, first	1	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2022, Workers' Rights in Just Transition, Adaptation, fourth	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-Cutting
Asia Regional	2022, Workers' Rights in Just Transition, Adaptation, second	1	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting
Asia Regional	2022, Workers' Rights in Just Transition, Adaptation, third	0.75	Committed	Regional	ODA	Grant	Adaptation	Cross-cutting

Egypt	2022, Workforce Egypt, Mitigation	3.8	Committed	Bilateral	ODA	Grant	Mitigation	Cross-Cutting
Cambodia	2022, World Health Organization Consolidated Grant II (WHOCG II), Adaptation - Climate Specific	0.3	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Africa Regional	2022, Yalwa, Adaptation,	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Niger	2022, Yalwa, Adaptation, first	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Niger	2022, Yalwa, Adaptation, second	0.235	Committed	Bilateral	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Yidgiri, Adaptation, first	0.5	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Africa Regional	2022, Yidgiri, Adaptation, second	0.25	Committed	Regional	ODA	Grant	Adaptation	Agriculture
Honduras	2022, Youth Conservation Corps, Adaptation	1.5	Committed	Bilateral	ODA	Grant	Adaptation	Forestry
Nigeria	2022, Youth Leadership/Innovation, Adaptation	0.616	Committed	Bilateral	ODA	Grant	Adaptation	Other
India	2022, Yulu Bikes Pvt Ltd, Mitigation	9	Committed	Bilateral	OOF	Concessional loan	Mitigation	Transport
Zambia	2022, Zambia Accessible Markets for Health (ZAM-Health), Adaptation - Climate Specific	0.263	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Zambia Integrated HIV and Health Activity, Adaptation, first - Climate Specific	0.2	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Zambia	2022, Zambia Integrated HIV and Health Activity, Adaptation, second - Climate Specific	0.162	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)
Global	2022, Zero Emission Vehicles Accelerator (ZEV-A), Mitigation	1	Committed	Multi-Bilateral	ODA	Grant	Mitigation	Energy
Zimbabwe	2022, Zimbabwe Assistance Program in Malaria II (ZAPIM II), Adaptation - Climate Specific	2.4	Committed	Bilateral	ODA	Grant	Adaptation	Other (Health)

Multilateral Climate Finance Provided

This table covers MPG paragraph 124.

Year	Multilateral Fund	Core/General (Face Value, USD millions)	Climate-Specific (Face Value, USD millions)	Recipient	Status	Channel	Funding Source	Financial Instrument	Type of Support
2022	Adaptation Fund		25	Global	Committed	Multilateral	ODA	Grant	Adaptation

2021	African Development Bank	225.9		Global	Committed	Multilateral	ODA	Grant	
2022	African Development Bank	265.9		Global	Committed	Multilateral	ODA	Grant	
2021	Asian Development Bank	47.3		Global	Committed	Multilateral	ODA	Grant	
2022	Asian Development Bank	53.3		Global	Committed	Multilateral	ODA	Grant	
2022	Clean Technology Fund		952	Global	Committed	Multilateral	ODA	Concessional loan	Mitigation
2021	Global Environment Facility	150	89.18	Global	Committed	Multilateral	ODA	Grant	Mitigation
2021	Global Environment Facility	151	29.64	Global	Committed	Multilateral	ODA	Grant	Mitigation
2022	Global Environment Facility	150	29.85	Global	Committed	Multilateral	ODA	Grant	Mitigation
2022	Global Environment Facility	150	97.84	Global	Committed	Multilateral	ODA	Grant	Mitigation
2021	IPCC/UNFCCC		3.73	Global	Committed	Multilateral	ODA	Grant	Mitigation
2021	IPCC/UNFCCC		3.73	Global	Committed	Multilateral	ODA	Grant	Adaptation
2022	IPCC/UNFCCC		7.5	Global	Committed	Multilateral	ODA	Grant	Mitigation
2022	IPCC/UNFCCC		7.5	Global	Committed	Multilateral	ODA	Grant	Adaptation
2021	Montreal Protocol Multilateral Fund		40.33	Global	Committed	Multilateral	ODA	Grant	Mitigation

2022	Montreal Protocol Multilateral Fund		51.9	Global	Committed	Multilateral	ODA	Grant	Mitigation
2022	UN HABITAT		0.7	Global	Committed	Multilateral	ODA	Grant	Adaptation
2022	UNEP		5.1	Global	Committed	Multilateral	ODA	Grant	Adaptation
2022	UNEP		5.1	Global	Committed	Multilateral	ODA	Grant	Mitigation
2022	UNICEF		15.7	Global	Committed	Multilateral	ODA	Grant	Adaptation
2021	World Bank	1,207.9		Global	Committed	Multilateral	ODA	Grant	
2022	World Bank	1,207.9		Global	Committed	Multilateral	ODA	Grant	
2021	World Meteorological Organization Voluntary Cooperation Program (WMO-VCP)		1	Global	Committed	Multilateral	ODA	Grant	Adaptation

Private Finance Mobilized by U.S. Public Finance

This table covers MPG paragraph 125.

Year	Recipient	Title	Channel	Amount Mobilized (Face Value, USD millions)	Type of Public Intervention	Type of Support	Sector

2021	Africa	2021 Africa Private Finance Mobilized from Development Finance for Mitigation	Regional	50.39	Concessional loan	Mitigation	Cross-cutting
2021	Asia	2021 Asia Private Finance Mobilized from Development Finance for Adaptation	Regional	8.33	Loan guarantee	Adaptation	Cross-cutting
2021	Asia	2021 Asia Private Finance Mobilized from Development Finance for Mitigation	Regional	79.66	Equity, Concessional loan, Loan guarantee	Mitigation	Cross-cutting
2021	Latin America & Caribbean	2021 Latin America & Caribbean Private Finance Mobilized from Development Finance for Adaptation	Regional	133.50	Loan guarantee	Adaptation	Cross-cutting
2021	Latin America & Caribbean	2021 Latin America & Caribbean Private Finance Mobilized from Development Finance for Mitigation	Regional	180.02	Concessional loan, Loan guarantee	Mitigation	Cross-cutting
2022	Africa	2022 Africa Finance Mobilized from Development Finance for Adaptation	Regional	2.52	Concessional loan	Adaptation	Cross-cutting
2022	Africa	2022 Africa Finance Mobilized from Development Finance for Mitigation	Regional	159.25	Equity, Concessional loan, Loan guarantee	Mitigation	Cross-cutting
2022	Asia	2022 Asia Finance Mobilized from Development Finance for Adaptation	Regional	8.35	Concessional loan	Adaptation	Cross-cutting

2022	Asia	2022 Asia Finance Mobilized from Development Finance for Mitigation	Regional	71.77	Concessional loan	Mitigation	Cross-cutting
2022	Europe & Eurasia	2022 Europe & Eurasia Private Finance Mobilized from Development Finance for Mitigation	Regional	15.00	Loan guarantee	Mitigation	Cross-cutting
2022	Global	2022 Global Private Finance Mobilized from Development Finance for Adaptation	Regional	246.67	Loan guarantee	Adaptation	Cross-cutting
2022	Global	2022 Global Private Finance Mobilized from Development Finance for Mitigation	Regional	5.00	Loan guarantee	Mitigation	Cross-cutting
2022	Philippines	Aboitiz Power Smart Grid Implementation Roadmap and Pilot Project	Bilateral	3.00	Grant	Mitigation	Energy
2022	Indonesia	Advancing Cocoa Agroforestry Towards Income, Value and Environmental Sustainability	Bilateral	0.005	Grant	Mitigation	Agriculture
2022	Global	Advancing Modern Power Through Utility Partnerships	Regional	0.01	Grant	Mitigation	Energy
2022	Global	Advancing Modern Power Through Utility Partnerships	Regional	0.01	Grant	Adaptation	Energy
2022	Zambia	Alternatives to Charcoal	Bilateral	0.65	Grant	Mitigation	Energy
2021	Pakistan	Beaconhouse Schools Solar Photovoltaic Power Systems	Bilateral	1.63	Grant	Mitigation	Energy
2021	Indonesia	Build Indonesia to Take Care of Nature for Sustainability Project	Bilateral	0.05	Grant	Mitigation	Forestry
2021	Cambodia	Cambodia Green Future Activity	Bilateral	0.001	Grant	Mitigation	Cross-cutting
2021	Vietnam, Indonesia	Clean and Advanced Energy Investment Accelerator	Regional	17.59	Grant	Mitigation	Energy
2022	Asia	Clean Power Asia Activity	Regional	5900.38	Grant	Mitigation	Energy
2021	Asia	Clean Power Asia Activity	Regional	1107.20	Grant	Adaptation	Energy
2022	Nigeria	Darway Coast Energy Access Project	Bilateral	11.59	Grant	Mitigation	Energy
2021	Global	Energy Utility Partnership Program	Regional	0.12	Grant	Mitigation	Energy
2022	Global	Energy Utility Partnership Program	Regional	0.07	Grant	Mitigation	Energy
2021	Cambodia	Feed the Future Cambodia Harvest II	Bilateral	1.60	Grant	Mitigation	Agriculture

2022	Cambodia	Feed the Future Cambodia Harvest II	Bilateral	0.68	Grant	Mitigation	Agriculture
2022	India	Forest Plus 2.0- Forest for Water & Prosperity	Bilateral	2.13	Grant	Mitigation	Forestry
2021	India	Forest Plus 2.0- Forest for Water & Prosperity	Bilateral	0.21	Grant	Mitigation	Forestry
2022	Global	FTF Building a Resilient Future Activity	Regional	1.50	Grant	Adaptation	Agriculture
2022	Global	Geological Survey	Regional	0.50	Grant	Mitigation	Cross-cutting
2022	Global	Global Forest Watch 3.0	Regional	1.91	Grant	Mitigation	Forestry
2021	Global	Global Forest Watch 3.0	Regional	1.60	Grant	Mitigation	Forestry
2022	Indonesia, Colombia	Global Power System Transformation Consortium (G-PST)	Regional	0.01	Grant	Mitigation	Energy
	Malawi	Golomoti Solar Power Project	Bilateral	22.50	Grant	Mitigation	Energy
2022	Asia	Green Invest Asia	Regional	127.50	Grant	Mitigation	Cross-cutting
2021	Asia	Green Invest Asia	Regional	11.00	Grant	Mitigation	Cross-cutting
2021	Cambodia	Green Invest Asia (GIA)	Bilateral	3.20	Grant	Mitigation	Cross-cutting
2021	Cambodia	Greening Prey Lang	Bilateral	8.01	Grant	Adaptation	Forestry
2022	Cambodia	Greening Prey Lang	Bilateral	8.01	Grant	Mitigation	Forestry
2021	Cambodia	Greening Prey Lang	Bilateral	1.66	Grant	Adaptation	Forestry
2022	Cambodia	Greening Prey Lang	Bilateral	1.66	Grant	Mitigation	Forestry
2021	India	India Clean Energy Finance Hub	Bilateral	144.40	Equity	Mitigation	Energy
2022	Philippines	Investing in Sustainability and Partnerships for Inclusive Growth and Regenerative Ecosystems (INSPIRE)	Bilateral	0.02	Grant	Mitigation	Cross-cutting
2022	Palau	Island-Led Resilience Project (IRL2030)	Bilateral	0.08	Grant	Adaptation	Cross-cutting
2021	Cambodia	Keo Seima Conservation Project	Bilateral	34.00	Grant	Mitigation	Forestry
2021	India	Market Integration Transformation for Energy Efficiency	Bilateral	10.00	Grant	Mitigation	Energy
2022	Asia	Mekong Sustainable Manufacturing Alliance	Regional	2.88	Grant	Mitigation	Industry
2021	Malawi	Modern Cooking for Healthy Forests in Malawi	Bilateral	2.75	Grant	Mitigation	Forestry
2022	Malawi	Modern Cooking for Healthy Forests in Malawi	Bilateral	0.15	Grant	Mitigation	Forestry
2021	Asia	National Renewable Energy Laboratory for Technical Leadership on Advanced Energy Systems in Asia	Regional	0.03	Grant	Mitigation	Energy
2021	Peru	Natural Infrastructure for Water Security (NIWS) project	Bilateral	0.48	Grant	Adaptation	Water and sanitation
2022	Tanzania	NextGen Solawazi Owner's Engineer Project	Bilateral	1.00	Grant	Mitigation	Energy

2021	Global	PAPA 2016	Regional	0.09	Grant	Mitigation	Cross-cutting
2022	Peru	PREVENT	Bilateral	0.82	Grant	Mitigation	Forestry
2021	Philippines	Protect Wildlife	Bilateral	0.01	Grant	Mitigation	Forestry
2022	Dominican Republic	Punta Cana Biomass and Waste-to-Energy Plant	Bilateral	10.00	Grant	Mitigation	Energy
2021	Philippines	Safe Water	Bilateral	9.29	Grant	Mitigation	Water and sanitation
2022	Philippines	Safe Water	Bilateral	7.37	Grant	Mitigation	Water and sanitation
2022	Peru	Securing a Sustainable, Inclusive & Profitable Forest Sector in Peru (Pro-Bosques)	Bilateral	0.36	Grant	Mitigation	Forestry
2021	Peru	Securing a Sustainable, Inclusive & Profitable Forest Sector in Peru (Pro-Bosques)	Bilateral	0.27	Grant	Mitigation	Forestry
2021	Asia	SERVIR Global - Science Coordination	Regional	0.05	Grant	Mitigation	Cross-cutting
2022	Asia	SERVIR Global - Science Coordination	Regional	0.01	Grant	Adaptation	Cross-cutting
2022	Lao, Vietnam, Cambodia, Nepal	SilvaCarbon FY15	Regional	0.01	Grant	Mitigation	Forestry
2021	Africa	Southern Africa Energy Program	Regional	1436.60	Grant	Mitigation	Energy
2022	Africa	Southern Africa Energy Program	Regional	652.30	Grant	Mitigation	Energy
2022	Indonesia	Sustainable Energy for Indonesia's Advancing Resilience	Bilateral	7.18	Grant	Mitigation	Energy
2022	Indonesia	Sustainable Environmental Governance Across Regions	Bilateral	0.07	Grant	Mitigation	Cross-cutting
2022	Vietnam	Sustainable Forest Management (SFM)	Bilateral	0.23	Grant	Mitigation	Forestry
2021	Philippines	Sustainable Interventions for Biodiversity, Oceans, and Landscapes Activity (SIBOL)	Bilateral	0.47	Grant	Mitigation	Forestry
2022	Madagascar	Sustainable Vanilla for People and Nature	Bilateral	0.04	Grant	Mitigation	Agriculture
2022	Global	Technical Collaboration for Advanced Energy Systems	Regional	81.73	Grant	Mitigation	Energy
2021	Global	Technical Collaboration for Advanced Energy Systems	Regional	40.44	Grant	Mitigation	Energy
2021	Peru	The Amazonian Center for Environmental Research and Sustainability Project (CINCIA)	Bilateral	0.30	Grant	Mitigation	Cross-cutting
2021	Zambia, Nigeria	U.S.-Africa Clean Energy Finance Initiative (ACEF)	Regional	9.20	Grant	Mitigation	Energy

2022	Africa	U.S.-Africa Clean Energy Finance Initiative (ACEF)	Regional	1.50	Grant	Mitigation	Energy
2022	Middle East	Water and Energy for Food Grand Challenge Middle East and North Africa Regional Innovation Hub	Regional	8.75	Grant	Mitigation	Cross-cutting
2022	Middle East	Water and Energy for Food Grand Challenge Middle East and North Africa Regional Innovation Hub	Regional	3.70	Grant	Adaptation	Cross-cutting
2022	Mozambique	Water, Sanitation and Hygiene Finance	Bilateral	0.04	Grant	Adaptation	Water and sanitation
2021	Cambodia	Wildlife Sanctuary Support Program	Bilateral	0.08	Grant	Mitigation	Cross-cutting
2021	Indonesia	Winrock Private Investment for Enhanced Resilience (PIER)	Bilateral	45.16	Grant	Adaptation	Cross-cutting

Activities that Contribute to Technology Development and Transfer Objectives

This table covers MPG paragraph 127.

This table is a representative sample, but does not represent the comprehensive list of all U.S. funded activities that contribute to the technology development and transfer objectives.

Recipient	Title of the Project Program, Activity or Other	Estimated Amount (USD millions)	Description and Objectives	Type of Support	Sector	Subsector	Type of technology	Status of Measure or Activity	Activity Undertaken By
Peru	2021, Amazon Business Alliance, Mitigation	0.779	The Amazon Business Alliance, which is cofunded with Canada, promotes the growth of value chains with high social and environmental sustainability impact. ABA promotes green investments creating new development opportunities and reducing environmental impacts through: a) combined financing instruments; b) technical assistance aimed at supporting local enterprises and actors with an emphasis on innovative technologies; c)	Mitigation	Industry		NR	Ongoing	Public sector

			development of strategic public-private alliances; and d) increased public and private investment.						
Global	2021, Center for International Forestry – World Agroforestry (CIFOR-ICRAF) Research Partnership, Mitigation	0.15	The purpose of this agreement with CIFOR-ICRAF is to allow the United States to contribute to multi-donor supported, policy-relevant research projects led by CIFOR-ICRAF. These research project areas include, but are not limited to: 1) The Sustainable Wetlands Adaptation and Mitigation Program (SWAMP), which provides critical data on tropical wetlands in support of country-led efforts on wetland conservation and restoration for climate change mitigation and adaptation; 2) Sustainable landscapes and livelihoods, which explores the complex relationships between forests, nutrition, food security and the biological diversity that is critical to our planet's survival; 3) Soil health, which provides robust and actionable research on soil and land health, with a focus on soils' ability to sequester carbon, store and regulate water and nutrients, and provide ecosystem services; and 4) Forest and landscape restoration, which develops the evidence, tools, and analysis countries need to help landscapes recover and thrive.	Mitigation	other			Ongoing	Public sector
Global	2021, Center for International Forestry Research (CIFOR) Biodiversity Research, Mitigation	0.4	The Center for International Forestry Research (CIFOR) conducts policy-relevant research that improves our understanding of the role of forests and wildlife for food security. CIFOR will seek options to reduce the unsustainable consumption of wild meat, understand the environmental dimensions of zoonotic disease transmission like the SARS-CoV-2 virus, and partner with agriculture and nutrition partners to demonstrate integrated ways to improve nutrition status and farm	Mitigation	other			Ongoing	Public sector

			productivity. CIFOR will continue to provide training on forestry and food security topics to local communities, practitioners, students, and government officials. CIFOR will also support graduate students from developing countries, nurturing the next generation of conservation and development leaders. Finally, CIFOR's research will contribute to forestry and biodiversity policy development as it relates to food security at the international, national, and provincial levels.						
Peru	2021, CINCIA ACIERTA: Alliance for Science & Ecosystem Recovery, Adaptation	0.3	The Center for Amazonian Scientific Innovation (CINCIA) promotes cutting-edge research programs to better understand the breadth and concentration of mercury pollution in Madre de Dios and Loreto, test various and innovative reforestation and restoration methodologies and plant species and improve geospatial analysis of deforested mining areas using drones.	Adaptation	Forestry			Ongoing	Public sector
Peru	2021, CINCIA ACIERTA: Alliance for Science & Ecosystem Recovery, Mitigation	0.9	The Center for Amazonian Scientific Innovation (CINCIA) promotes cutting-edge research programs to better understand the breadth and concentration of mercury pollution in Madre de Dios and Loreto, test various and innovative reforestation and restoration methodologies and plant species and improve geospatial analysis of deforested mining areas using drones.	Mitigation	Other			Ongoing	Public sector
Global	2021, Clean Technology and Trade Partnership Initiative's Accelerating Clean Energy Transitions Technology Needs Assessment, Mitigation	0.7	The Clean Technology and Trade Partnership Initiative will develop the tools to connect decarbonization needs in partner countries with U.S. clean technologies; boost bilateral trade and exports of U.S. clean energy goods and services; and partner with governments and the private sector in emerging economies to build capacity for clean technology adoption. This project will help countries	Mitigation	Energy			Ongoing	Public sector

			undertake ambitious emissions reduction measures and promote the flow of capital toward climate-aligned investments. The U.S. government will advance the objectives of the initiative in key countries through promoting industry and government-to-government engagement on technology codes, standards, and regulatory frameworks, leading virtual or in-country workshops on enhancing financing mechanisms for clean technologies, and working with in-country stakeholders on engagement with emerging decarbonization and adaptation technologies. Another critical component of the Clean Technology and Trade Partnership is conducting market and needs assessments in select countries for clean technologies and assessing the potential for U.S. technologies to meet those needs in critical emerging markets. These assessments will help countries better understand the barriers and opportunities that exist for the adoption of promising clean technologies, which will provide insights into the needed near-term actions that must be taken in order to unlock longer-term benefits.						
Global	2021, Clean Technology Trade and Partnership Initiative, Mitigation	1	The Clean Technology and Trade Partnership Initiative will develop the tools to connect decarbonization needs in partner countries with U.S. clean technologies; boost bilateral trade and exports of U.S. clean energy goods and services; and partner with governments and the private sector in emerging economies to build capacity for clean technology adoption. This project will help countries undertake ambitious emissions reduction measures and promote the flow of capital toward climate-aligned investments, key goals of the President’s Executive Order 14008, “Tackling the Climate Crisis at Home and Abroad.”	Mitigation	Energy			Ongoing	Public sector

			The U.S. government has substantial expertise on trade, commercial development, and opportunities and obstacles specific to cleantech industries. As such, the U.S. will be able to advance the objectives of the initiative in key countries through promoting industry and government-to-government engagement on technology codes, standards, and regulatory frameworks, leading virtual or in-country workshops on enhancing financing mechanisms for clean technologies, and working with in-country stakeholders on engagement with emerging decarbonization and adaptation technologies.						
Peru	2021, Combatting Environmental Crimes in the Peruvian Amazon, Mitigation, first	2.8	Through this activity, the United States provides specialized technical assistance, training, and other services to strengthen the institutional capacity of key Peruvian institutions and actors, leading to effective prevention, detection and sanctioning of environmental crimes. With an integrated multi-agency approach, this activity will strengthen the Government of Peru's capacity to design and implement policies, laws, and regulations that effectively prevent, detect and sanction environmental crimes to reduce deforestation and forest degradation and other forest crimes. The United States will also engage civil society organizations, including indigenous communities, to develop their capacity to prevent, monitor, and report environmental crimes in support of conservation goals. It will also strengthen community oversight capacity to patrol protected areas and support innovations, including new technologies aimed at reducing threats, with the engagement of the private sector.	Mitigation	Other			Ongoing	Public sector

Uganda	2021, Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot, Adaptation	0.111	Through its Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot Activity (FTF Nafoore Warsaaji), the United States is providing assistance through Connexus Corp to small-scale farmers, including women in market gardening activities and women producer groups. The assistance aims to commercialize horticulture opportunities for rural farmers through bundling packages of technology and technical support services in Senegal. The activity increases smallholder farmers' resilience to weather and climate-related risks by linking farmers to climate information services for decision-making and advisory support.	Adaptation	Agriculture			Ongoing	Public sector
Uganda	2021, Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot, Mitigation	0.111	Through its Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot Activity (FTF Nafoore Warsaaji), the United States is providing assistance through Connexus Corp to small-scale farmers, including women in market gardening activities and women producer groups. The assistance aims to commercialize horticulture opportunities for rural farmers through bundling packages of technology and technical support services in Senegal. The activity increases smallholder farmers' resilience to weather and climate-related risks by linking farmers to climate information services for decision-making and advisory support.	Mitigation	Agriculture			Ongoing	Public sector
Global	2021, First Movers Coalition, Mitigation	1.5	The First Movers Coalition (FMC) is an initiative to build private sector demand for emerging clean energy technologies that are not yet commercially viable but are needed to decarbonize hard-to-abate sectors and reach global net-zero emissions. The U.S. government has partnered with the World Economic Forum to develop and	Mitigation	Energy			Ongoing	Public sector

			launch the FMC as a platform for companies to make purchasing commitments to create the early markets for emerging technologies across eight key sectors spanning hard-to-abate applications from heavy industry to long-distance transportation.						
Paraguay	2021, Forest Conservation Agriculture Alliance (FCAA), Mitigation- Climate Specific	0.85	The FCAA activity is a partnership with private sector stakeholders along the beef value chain in Paraguay that promotes improved technology and management practices in livestock production and a sustainable land use framework to reduce deforestation. Through FCAA, LAC/Regional Program (LAC/RP) will work to decrease deforestation in the Chaco region of Paraguay, which has one of the highest deforestation rates in the world. The FCAA will scale activities and increase incentives for the adoption of sustainable agricultural practices in the Chaco region. FCAA works with key actors in the public and private sectors and civil society to reach consensus on practices to improve productivity and land use management across selected jurisdictions in key landscapes.The activity will strengthen the government's capacity to establish the enabling environment for market-based sustainable land use management, including by improving the quality and availability of land use information systems for monitoring and enforcement.	Mitigation	other			Ongoing	Public sector
Global	2021, Forest Data Partnership, Mitigation	1.5	The Forest Data Partnership is a partnership between the U.S. government, the World Resources Institute, Unilever, Google, and the United Nations Food and Agriculture Organization that will address a key barrier to private investment in forests and restoration - the lack of reliable and accessible data on forests and lands. These funds will	Mitigation	other			Ongoing	Public sector

			be combined with existing programs and further enhance the Forest Data Partnership's efforts to: align with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions. This approach will establish the enabling conditions to achieve full traceability, transparency and accountability in key commodity supply chains and restoration initiatives in a cost-effective manner.						
Bangladesh	2021, FTF Climate Smart Agriculture Activity, Adaptation- Climate Specific	1.1	The FTF Bangladesh Climate Smart Agriculture activity will improve smallholder farm household income, nutrition, and climate resilience by transforming rice-based agriculture into more diversified farming systems through climate smart agriculture (CSA) technologies.	Adaptation	Agriculture			Ongoing	Public sector
Global	2021, International Methane Emissions Observatory, Mitigation	0.7	The International Methane Emissions Observatory (IMEO) will serve as an independent entity to improve the accuracy and completeness of global methane emissions measurements to accelerate methane reduction activities. IMEO will integrate and assess data on methane emissions from multiple heterogeneous sources and to provide public, coherent, transparent, and empirically verified methane emissions data on a global basis, with increasing levels of accuracy and granularity. IMEO will build directly	Mitigation	Energy			Ongoing	Public sector

			on the achievements of the Climate and Clean Air Coalition's (CCAC) Mineral Methane Initiative Oil and Gas Methane Partnership to improve company-level reporting of methane emissions in the oil and gas sector, which constitutes a substantial share of cost-effective methane mitigation potential.						
Global	2021, LASER - Improving the Air Pollution Monitoring and Management of Vietnam with Satellite PM 2.5 Observation, Adaptation	0.165	LASER subaward project designed to study Improving the Air Pollution Monitoring and Management of Vietnam	Adaptation	Other			Ongoing	Public sector
Global	2021, Low Emission Development Strategies Global Partnership (LEDS-GP), Mitigation	2.5	The LEDS-GP currently serves as a central global initiative for advancing technical work on low emissions strategies in key sectors. Funding for LEDS-GP will support regional and global collaborative efforts to transition key sectors to resilient and to zero emissions models, building capacity for technical experts and policymakers. This will also support the burgeoning global effort to transform this network to a more ambitious "net zero coalition." The United States launched the LEDS Partnership in 2011 and it now has grown to 150 partners and serves as a forum for thousands of climate officials and practitioners to engage in regional and global initiatives that advance climate action and ambition.	Mitigation	Energy			Ongoing	Public sector
Ecuador	2021, Quito Electric Bus and Intelligent Transportation System (ITS) Modernization Technical Assistance for the Empresa Publica Metropolitana de Transporte	0.97	This grant funds the Quito Electric Bus and Intelligent Transportation System (ITS) Modernization Technical Assistance for the Empresa Publica Metropolitana de Transporte de Pasajeros de Quito (EPMTPQ) to modernize the public transit bus fleet and implement related intelligent transportation system (ITS) technologies in	Mitigation	Transport			Ongoing	Public sector

	de Pasajeros de Quito (EPMTPQ, Mitigation		Quito, Ecuador's capital city. The technical assistance would enable EPMTPQ to replace its diesel bus fleet with electric buses, as well as upgrade its bus stations, fare collection systems, and other ITS technologies. The grant is anticipated to help mobilize $131 million in financing.						
Peru, Colombia & Brazil	2021, SERVIR Amazonia, Mitigation	1.026	The U.S. government is developing user-friendly geospatial tools focused on drought and fire risk, water resources and hydro-climatic events, ecosystems management, and climate stress impacts. Tools developed will distill complex data into digestible formats to facilitate improved decision-making across the region. Based on a series of user needs assessments conducted in FY 2019, the United States and representatives from Colombia, Peru, Brazil and Ecuador prioritized environment-related development challenges to tackle. These assessments generated over 50 ideas for how to use geospatial data to solve national, and regional-level, challenges. Of the more than 50 ideas, 12 will be developed starting in FY 2020, including: 1) a tool to reduce the risk of extreme flooding; 2) an ecosystem services modeling tool to detect and monitor forest change to comply with zero-deforestation value chains; and 3) a tool to monitor illegal timber harvesting on indigenous territories through digital alerts.	Mitigation	Forestry			Ongoing	Public sector
Africa Regional	2021, SERVIR West Africa 2 (Follow-on to SERVIR WA), Adaptation	0.833	This buy-in to SERVIR West Africa will provide Resilience in the Sahel Enhanced (RISE) II with tailored access to ongoing data and geospatial imaging services under development by the SERVIR WA consortium institutions with support from the United States. SERVIR WA informs	Adaptation	Agriculture			Ongoing	Public sector

			and trains regional and national institutions on environmental issues and sustainable land and resource management by putting data into the hands of decision-makers in West Africa and serves as a regional hub for geospatial technology and analyses dissemination. Funds will be used to develop demand-driven services using geospatial data in the priority countries of Burkina Faso and Niger, with the potential to further scale across West Africa to address development problems in food security and agriculture, water and water-related disasters, climate and weather, and land cover/land use change. SERVIR WA provides a local principal investigator to work with U.S. university grantees on three applied sciences grants to improve the awareness, access and use of observation techniques by local, national, and regional institutions and governments and to build their capacity to provide user-tailored services to address development challenges. Buy-in will be primarily focused on demand-driven services using geospatial data. These services include but will not be limited to groundwater monitoring, commune mapping and natural resources management, and surface water/flood risk mapping services. By building the capacity of local and regional institutions, this activity, working in tandem with TerresEauVie and other RISE II activities, will enhance the journey to self-reliance of local partners to assess and manage their natural resources and related risks for long-term prosperity.						
Cambodia, Indonesia, Laos, Burma, Philippines,	2021, SERVIR-Mekong II SERVIR Southeast Asia, Adaptation	0.315	The U.S. is providing assistance to the SERVIR Southeast Asia program through the Asian Disaster Preparedness Center to promote the use of satellite data and climate models among Southeast Asian countries in order to	Adaptation	Cross-Cutting			Ongoing	Public sector

Thailand, Vietnam			strengthen climate resilience, prepare for and respond to disasters, and other enivormental challenges including natural resources management, food security and air pollution.						
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Adaptation, first	0.585	The U.S. is providing assistance to the SERVIR Southeast Asia program through the Asian Disaster Preparedness Center to promote the use of satellite data and climate models among Southeast Asian countries in order to strengthen climate resilience, prepare for and respond to disasters, and other enivormental challenges including natural resources management, food security and air pollution.	Adaptation	Cross-Cutting			Ongoing	Public sector
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Mitigation	0.1	The U.S. is providing assistance to the SERVIR Southeast Asia program through the Asian Disaster Preparedness Center to promote the use of satellite data and climate models among Southeast Asian countries in order to strengthen climate resilience, prepare for and respond to disasters, and other enivormental challenges including natural resources management, food security and air pollution.	Mitigation	Cross-Cutting			Ongoing	Public sector
Global	2021, SEVIR Activity, Mitigation	0.65	SERVIR connects space to village by helping developing countries use information provided by Earth observing satellites and geospatial technologies to address critical challenges in food security, water resources, weather and climate, land use, natural disasters, and air quality. A partnership of leading technical organizations around the world, SERVIR works with partners to co-develop innovative solutions to improve livelihoods and foster self-reliance in Asia, Africa, and the Americas. The U.S. government provides science and geospatial technology	Mitigation	Cross-cutting			Ongoing	Public sector

			support and coordination to five regional hub organizations across the SERVIR network. The SERVIR SCO will continue to provide key science and technical support and coordination to the SERVIR network, respond to SERVIR hub needs, including direct science support, geospatial information technology support, and scientific oversight, technical backstopping and integration in support of activities for the new Applied Sciences Team (a set of 20 researchers from US institutions that collaborate with hubs to design and implement demand-driven services), and subject matter experts to support Amazonia and West Africa hub activities. The SCO will support in delivering on four strategic results: 1) Building regional and national capacity and commitment to use science and technology; 2) Delivering impactful solutions to build resilience and address food security challenges; 3) Enabling the agency to tell impact stories with remote sensing tools; and 4) Providing global thought leadership and influence in use of Earth observation to advance development goals and build local capacity and country self-reliance.						
Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Chad, Côte D'Ivoire, Djibouti, Ethiopia,	2021, SEVIR African Regional Data Hub Funding, Adaptation	1.63	Through SERVIR, the U.S. government is providing assistance through the Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi, Kenya, and the Agrometeorology, Hydrology and Meteorology Regional Center, in Niamey, Niger and its regional consortium partners. The assistance will increase access to information and analyses to help people in sub-Saharan Africa address critical challenges in climate change, food security, water and related disasters, land	Adaptation	Cross-cutting			Ongoing	Public sector

Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Togo, Tanzania, Uganda, Zambia			use, and air quality. Partnering with these regional hub organizations, the SERVIR Science Coordination Office (SCO) and Applied Sciences Teams (AST) subject matter experts develop user-focused geospatial information services, including training, products, and tools, improving capacity of regional institutions to develop local solutions.						
Brazil	2021, Smart RJ Concessionaria, Mitigation	174	Provision of public lighting services and smart city infrastructure throughout the city of Rio de Janeiro.	Mitigation	Cross-cutting			Ongoing	Public sector
Global	2021, Smart Utilities Promoting Energy Reform (SUPER), Mitigation	0.361	The Strengthening Utilities and Promoting Energy Reform (SUPER) Task Order (TO) aims to promote utility commercialization and equitable, effective reforms that will enhance the financial viability and long-term sustainability of developing countries' electricity systems and thereby enable their expansion and growth, and establish the necessary preconditions for additional private sector investments. Illustrative activities include capacity building and support for developing robust sector	Mitigation	other			Ongoing	Public sector

			expansion plans; establishing legal, policy and institutional frameworks to support competitive private sector investment; assessing proposed power sector investments to ensure value-for-money and financial sustainability; integrating new technologies for improved commercial and technical performance; reducing losses and increasing revenues to increase power sector financial viability; and strengthening regulatory frameworks to improve transparency in power sector operations. The SUPER Task Order can help partner countries conduct data-driven planning and make informed investment decisions that avoid the risk of debt traps from unnecessary projects. Conducting transparent, competitive procurements can help deliver the greatest value-for-money and bring responsible, technically capable stakeholders to the table. Stronger commercial practices and regulatory frameworks help create a sustainable, rules-based approach to power sector development and operations, creating a stronger path to self-reliance. The TO will empower women and reduce gender gaps in the energy sector and across the value chain.						
Nigeria	2021, Sosai Sustainable Minigrids for Energy Access and Social Inclusion Feasibility Study in Nigeria, Mitigation	1	This grant, the Sosai Sustainable Minigrids for Energy Access and Social Inclusion Feasibility Study, funds a feasibility study (Study) for Sosai Renewable Energies Company Limited (Sosai) to support the development of approximately 100 solar minigrids, and an associated low voltage distribution network, in the Nigerian States of Kaduna, Plateau, and Kogi. The study was competed among U.S. firms and awarded to Energy Markets Group, Inc. (EMG). This grant is anticipated to mobilize $59 million in financing.	Mitigation	Energy			Ongoing	Public sector

Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2021, Southeast Asia Smart Power Program, Mitigation	0.8	Support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Mitigation	Energy			Ongoing	Public sector
Bangladesh	2021, Supply Chain Technical Assistance, Mitigation	0.45	The FTF Livestock and Nutrition activity will provide technical assistance for capacity building of livestock farming communities to cope with climate shocks though adaptation of climate-smart technologies and practices such as production of saline and water-tolerant fodder varieties along the coastline of southern Bangladesh.	Mitigation	Other			Ongoing	Public sector
Kenya	2021, Sustainable Conservation and Management of Maasai Mara Landscape, Adaptation	0.2	The activity will engage in partnerships with community conservancies, the Narok County Government, civil society organizations, and tourism partners to co-create integrated locally-led conservation and cross-sectoral development approaches. Interventions will target biodiversity conservation, tourism, gender and youth, health, agriculture and nutrition, water, education, plastic management, and climate resilience sectors. As a result of the work of this activity, more Kenyan organizations will be able to lead, own and manage locally-led conservation which will in turn lead to improved biodiversity conservation, expanded wildlife space through land leasing, improved community livelihoods and health, and economic empowerment especially for women and youth.	Adaptation	Other			Ongoing	Public sector

Global	2021, Technical Assistance Facility to Mobilize Private Capital (CRAFT), Adaptation	2.5	Funds will support rapidly accelerating the deployment of adaptation technologies, such as solar hydro panels that provide a sustainable source of clean water in water stressed communities, in low-income countries, and Small Island Developing States (SIDS). Additionally, TA facility market studies will identify the opportunity and need for specific climate resilience solutions. These studies will de-risk market entry into countries and make the successful introduction of solutions more likely; assist in scoping, evaluating, designing, and developing specific customer implementations or deployment projects in developing countries; and provide funding for first-of-a-kind pilot or seed projects that can then be subsequently scaled up without further support, such as providing first loss components for innovative finance mechanisms to apply climate resilience solutions.	Adaptation	Industry			Ongoing	Public sector
Global	2021, Technical Collaboration on Advanced Energy Systems, Mitigation	0.764	Supports the deployment of advanced energy systems to enable secure, resilient, and sustainable economic growth in our partner countries. Provides targeted technical assistance to developing country partners and improve their self-reliance in the energy sector. Funds will support global platforms and targeted technical assistance to support the modernization of power grids, increased resilience and security of power systems in the face of disasters, improved markets for deployment of advanced energy technologies including storage and electric vehicles, power sector cybersecurity enhancement, and scale up of energy efficient technologies, practices, and policies. Targeted technical assistance supports policy-makers, regulators, power system planners, power system operators, industry players, and investors on these topics.	Mitigation	other			Ongoing	Public sector

			Activities will employ Greening the Grid, the Resilient Power Platform, the RE Explorer, and Efficiency for Development tools and methodologies in countries or regions, to accelerate and add value to bilateral programs in Asia, Eastern Europe, Latin America/Caribbean, and Africa. The U.S. will support partners as they design and implement green, COVID-recovery plans, taking into account nationally determined contributions (NDC). This activity may support robust carbon markets; strengthen and facilitate engagement in global initiatives and provide assistance to countries to help them successfully implement their mitigation and adaptation policies and plans including NDCs and long-term strategies.						
Benin	2021, Technology for Energy Access and Minigrid Development Technical Assistance in Benin, Mitigation	0.99	This grant funds the U.S. Technology for Energy Access and Minigrid Development Technical Assistance to support energy access through solar minigrids and pilot a U.S.-made digitalized system for minigrid management in Benin. The grant is anticipated to help mobilize $17 million in financing.	Mitigation	Energy			Ongoing	Public sector
Uganda	2021, Uganda Agricultural Research Activity, Adaptation	0.05	The Uganda Agriculture Research activity aims to promote the development and dissemination of improved, nutritious food security crops. It focuses on improving crop genetics for increased yields and climate resilience, bio-fortification for nutritional value (Vitamin A in Sweet potatoes and Banana) and management of aflatoxins , and integrated pest management. The activity consolidates past research efforts that developed a diverse array of near-ready crop varieties and will support the release and commercialization of the varieties to support food security and increased incomes. The activity is strengthening seed	Adaptation	Agriculture			Ongoing	Public sector

			systems for commercial production and delivery of quality seed and other planting materials through youth and women groups. The activity is also strengthening public-private partnerships and market linkages for the different critical crops and other interlinking value chains to create a robust seed quality assurance and control system. In addition, working through the National Agricultural Research Organization (NARO), the activity is creating a pool of well-trained personnel with technical knowledge and skills to conduct conventional and modern biotechnology research. This will enhance NARO's institutional capacity to release and commercialize both conventional and biotechnology products and other production and post-harvest technologies. The activity will focus on 1) incubating technology and product prototypes and 2) market studies that will engage with different actors to establish which products, varieties, and technologies match market demands.						
Thailand	2021, Utility Data Management Strategy and Implementation Plan Technical Assistance in support of the Provincial Electricity Authority (PEA) in Thailand, Mitigation	1.25	This grant funds the Utility Data Management Strategy and Implementation Plan Technical Assistance in support of the Provincial Electricity Authority (PEA) of Thailand to examine the current data management environment at PEA and propose a comprehensive Common Information Model (CIM)-based data management strategy and implementation plan. The TA will position PEA to launch an enterprise-wide initiative to build the robust data management capability it needs to address the challenges of safe, reliable and cost-effective management of its electricity distribution grid. PEA selected the Electric Power Research Institute, Inc. (EPRI) to serve as the sole-source	Mitigation	Energy			Ongoing	Public sector

			contractor to perform the TA. The grant is anticipated to mobilize $30 million in financing.						
Africa Regional	2021, Weather and Climate Information Services Activity, Adaptation	0.857	The Weather and Climate Information Services (WCIS) Activity will build off Senegal's previous efforts, backed by U.S. investments, to support farmers, herders and fishers to better understand, communicate and effectively use WCIS when making business decisions in the face of climate variability and change. It will boost the development of the WCIS value chain and the design of user-centered products by helping the National Agency for Civil Aviation and Meteorology's (ANACIM) better engage with private sector distributors for the quality delivery of downscaled, timely, and differentiated fee-based products and services. Toward the ultimate goal of a successful value chain development, the activity will lead policy efforts that reinforce the enabling environment for Public-Private Partnerships (PPPs) and working business models. Funds will support ANACIM to strengthen its capacity to produce diversified, tailored and downscaled WCIS responsive to climate variability and change. ANACIM and private sector providers will be better able to develop and operationalize effective PPPs to co-create new WCIS. The U.S. will also support the Government of Senegal to improve the regulatory framework governing PPPs, as well as helping private sector actors improve their access to capital and develop market linkages. These investments will result in farmers, pastoralists, and fisherfolks having an increased willingness to pay for WCIS, and increased access to improved WCIS products at an attractive price.	Adaptation	Cross-Cutting			Ongoing	Public sector

Philippines	2022, Amacan Geothermal Project Feasibility Study, Mitigation	0.41	This grant for the Amacan Geothermal Project Feasibility Study, funds a feasibility study for Energy Development Corporation (EDC), a private energy developer, to support the development of a geothermal power generation plant in Amacan in the island of Mindanao in the Philippines. The feasibility study will provide a geothermal resource assessment, preliminary site selection and development, technology assessment, interconnection analysis and design, financial analysis, regulatory review, a preliminary environmental and social assessment, and an implementation plan to support clean energy in the Philippines. This grant is anticipated to mobilize $288 million in financing.	Mitigation	Energy			Ongoing	Public sector
India	2022, BSES Yamuna Power Limited Energy Integration Roadmap Technical Assistance, Mitigation	0.74	This grant funds the BSES Yamuna Power Limited Energy Integration Roadmap Technical Assistance for BSES Yamuna Power Limited (BYPL), a private distribution company in India, to develop a platform for centralized energy data integration and preparation of a digital technology roadmap to enhance the overall efficiency of the data handing process for BYPL in its service area in Delhi, India. The implementation of the project will provide BYPL with an energy data integration platform that will allow all data points from BYPL's various operations systems to be captured in a centralized data hub. The grant is anticipated to help mobilize $245 million in financing.	Mitigation	Energy			Ongoing	Public sector
Global	2022, Center for International Forestry – World Agroforestry (CIFOR-ICRAF) Research Partnership, Mitigation	0.35	The activity will engage in partnerships with community conservancies, the Narok County Government, civil society organizations, and tourism partners to co-create integrated locally-led conservation and cross-sectoral development approaches. Interventions will target	Mitigation	Forestry			Ongoing	Public sector

			biodiversity conservation, tourism, gender and youth, health, agriculture and nutrition, water, education, plastic management, and climate resilience sectors.						
Pakistan	2022, Climate Smart Agriculture, Adaptation-Climate Specific	0.1	The activity will introduce and promote technologies for adaptation and resilience to minimize the impact of climate change and to build resilience while increasing productivity. This purpose will be achieved by implementing the following components: improved farmers' use of CSA management practices and technology, increased use of digital platforms (DP) for information and services, improved efficiency of technologies firms to develop CSA technologies and reach out to the farmers and improved enabling environment for investment in CSA.	Adaptation	Agriculture			Ongoing	Public sector
Global	2022, Climate Smart SME Platform, Adaptation	0.15	The small and medium Enterprises (SMEs) Climate Smart Network (CSN) is designed to showcase and scale SME climate smart products and solutions, assist with their compliance to established environmental standards and certifications, and solidify their commitment to low-carbon practices.	Adaptation	Cross-cutting			Ongoing	Public sector
Global	2022, Coalition for Operational Research on Neglected Tropical Diseases (COR - NTD), Adaptation	0.25	The COR-NTD grant supports a number of operational research projects that addresses a range of climate challenge that may impact programming such as a software tools to monitor possible re-emergence of NTDs as worsening climate change increases the risk of recrudescence or tools to better identify and reach mobile populations such as those that may be displaced by climate change related factors.	Adaptation	Other (Health)			Ongoing	Public sector

Global	2022, Country Health Information Systems and Data Use (CHISU), Adaptation, Multi-Country - Climate Specific	0.06	Strengthen data collection and use at the national, district and sub-district chiefdom levels. PMI will support the collection, reporting, and use of routine malaria data, through capacity building of malaria focal persons, monitoring and evaluation teams, and community health officers to collect, analyze and report quality malaria data using the national District Health Information System. The data collected is used to investigate the health impacts of climate change, or vulnerability or resilience to climate change impacts.	Adaptation	Other (Health)			Ongoing	Public sector
Uganda	2022, Country Health Information Systems and Data Use (CHISU), Adaptation, Uganda - Climate Specific	0.5	Strengthen data collection and use at the national, district and sub-district chiefdom levels. PMI will support the collection, reporting, and use of routine malaria data, through capacity building of malaria focal persons, monitoring and evaluation teams, and community health officers to collect, analyze and report quality malaria data using the national District Health Information System. The data collected is used to investigate the health impacts of climate change, or vulnerability or resilience to climate change impacts.	Adaptation	Other (Health)			Ongoing	Public sector
Uzbekistan	2022, Digital Twin Water Pilot Project Feasibility Study, Adaptation	0.45	The Digital Twin Water Pilot Project Feasibility Study provides support to Uzbekistan's national water company, UzSuvTaminot, in deploying a GIS-based digital twin model to track water usage and identify leaks in real time to increase the efficiency of their water distribution system. The pilot project would involve a GIS system, asset management system, public engagement portal, and the installation of remote monitoring Internet of Things sensors. The feasibility study is anticipated to mobilize $110 million in financing.	Adaptation	Water and Sanitation			Ongoing	Public sector

Ecuador	2022, Electricity Transmission Digital Modernization Technical Assistance, Mitigation	0.79	This grant funds Electricity Transmission Digital Modernization Technical Assistance for Ecuador's national electric utility Empresa Pública Estratégica Corporación Eléctrica del Ecuador (CELEC EP). The technical assistance will develop a master plan for the digital transformation and modernization of Ecuador's national electricity transmission system, focused on deploying smart grid technologies, enhancing grid management capabilities, and improving operational efficiency. The project will offer commercial opportunities for a wide range of U.S. technologies, equipment, and services, including substation automation systems, digital protective relays, and related sensors. The grant is anticipated to help mobilize $97.6 million in financing.	Mitigation	Energy			Ongoing	Public sector
Nigeria	2022, Feed the Future Nigeria Agricultural Extension and Advisory Services and Technology Promotion Activity, Adaptation	0.151	The United States is providing assistance through International Institute of Tropical Agriculture to support vulnerable populations engage in basic farming activities that will improve food security, increase agricultural incomes, and improve resilience among smallholder farmers and their families in Benue, ross Rivers, Delta, Ebonyi, Kaduna, Kebbi an Niger States. The activity will provide technical assistance to introduce climate smart techniques that will support climate adaptation for the communities.	Adaptation	Agriculture			Ongoing	Public sector
Global	2022, Forest Data Partnership, Mitigation	0.5	The Forest Data Partnership is a partnership between the U.S. government, the World Resources Institute, Unilever, Google, and the United Nations Food and Agriculture Organization that will address a key barrier to private investment in forests and restoration - the lack of reliable and accessible data on forests and lands. These funds will	Mitigation	Forestry			Ongoing	Public sector

			be combined with existing programs and further enhance the Forest Data Partnership's efforts to: align with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions. This approach will establish the enabling conditions to achieve full traceability, transparency and accountability in key commodity supply chains and restoration initiatives in a cost-effective manner.						
Global	2022, Forest Data Partnership, Mitigation, first	1.55	The Forest Data Partnership is a new partnership with the United States, the World Resources Institute, Unilever, Google, and the United Nations Food and Agriculture Organization that will address a key barrier to private investment in forests and restoration - the lack of reliable and accessible data on forests and lands. These funds will be combined with existing programs and further enhance the Forest Data Partnership's efforts to: align with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and	Mitigation	Forestry			Ongoing	Public sector

			mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions. This approach will establish the enabling conditions to achieve full traceability, transparency and accountability in key commodity supply chains and restoration initiatives in a cost-effective manner.						
Global	2022, Forest Data Partnership, Mitigation, second	0.9	The Forest Data Partnership is a partnership between the U.S. government, the World Resources Institute, Unilever, Google, and the United Nations Food and Agriculture Organization that will address a key barrier to private investment in forests and restoration - the lack of reliable and accessible data on forests and lands. These funds will be combined with existing programs and further enhance the Forest Data Partnership's efforts to: align with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions. This approach will establish the enabling conditions to achieve full traceability, transparency and accountability in key commodity supply chains and restoration initiatives in a cost-effective manner.	Mitigation	Forestry			Ongoing	Public sector

India	2022, FS India Solar Ventures Private Limited, Mitigation	500	3.3GW/Annum First Solar thin-film module manufacturing facility in India.	Mitigation	Energy			Ongoing	Public sector
Bangladesh	2022, FTF Climate Smart Agriculture Activity, Adaptation- Climate Specific	2	The FTF Bangladesh Climate Smart Agriculture activity will improve smallholder farm household income, nutrition, and climate resilience by transforming rice-based agriculture into more diversified farming systems through climate smart agriculture (CSA) technologies.	Adaptation	Agriculture			Ongoing	Public sector
Bangladesh	2022, FTF Climate Smart Agriculture Activity, Mitigation- Climate Specific	0.5	The FTF Bangladesh Climate Smart Agriculture activity will improve smallholder farm household income, nutrition, and climate resilience by transforming rice-based agriculture into more diversified farming systems through climate smart agriculture (CSA) technologies.	Mitigation	Agriculture			Ongoing	Public sector
Africa Regional	2022, FTF Soil Fertility Technology Adoption, Policy Reform and Knowledge Management Project (IFDC), Adaptation	0.5	The International Fertilizer Development Center (IFDC) enables smallholder farmers in developing countries to increase agricultural productivity, generate economic growth, and practice environmental stewardship by enhancing their ability to manage mineral and organic fertilizers responsibly and participate profitably in input and output markets. Activities: Project activities and interventions are characterized into three major focus areas: 1) IFDC continues “Developing and Validating Sustainable Agricultural Intensification Technologies and Practices,” addressing nutrient management issues and advancing sustainable agricultural intensification in FTF countries, 2) IFDC supports “Policy Reform Processes, Advocacy, and Market Development”, relevant research will be conducted to support IFDC’s global activities related to agricultural policy reforms, advocacy for change, and related efforts to	Adaptation	Agriculture			Ongoing	Public sector

			achieve impact in FTF countries' agriculture; and 3) IFDC supports activities under the SOILS Consortium. The SOILS Consortium also partners with a host of US academic research entities from Michigan State University, University of Colorado, Auburn University, and USDA-ARS. SOILS Consortium partners will further engage in identifying research activities that offer holistic solutions to developing a roadmap toward enhancing soil fertility in selected countries.						
Global	2022, FTF Soil Fertility Technology Adoption, Policy Reform and Knowledge Management Project (IFDC), Mitigation	5	The International Fertilizer Development Center (IFDC) enables smallholder farmers in developing countries to increase agricultural productivity, generate economic growth, and practice environmental stewardship by enhancing their ability to manage mineral and organic fertilizers responsibly and participate profitably in input and output markets. Activities: Project activities and interventions are characterized into three major focus areas: 1) IFDC continues "Developing and Validating Sustainable Agricultural Intensification Technologies and Practices," addressing nutrient management issues and advancing sustainable agricultural intensification in FTF countries, 2) IFDC supports "Policy Reform Processes, Advocacy, and Market Development", relevant research will be conducted to support IFDC's global activities related to agricultural policy reforms, advocacy for change, and related efforts to achieve impact in FTF countries' agriculture; and 3) IFDC supports activities under the SOILS Consortium. The SOILS Consortium also partners with a host of US academic research entities from Michigan State University,	Mitigation	Agriculture			Ongoing	Public sector

			University of Colorado, Auburn University, and USDA-ARS. SOILS Consortium partners will further engage in identifying research activities that offer holistic solutions to developing a roadmap toward enhancing soil fertility in selected countries.						
Africa Regional	2022, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation - Climate Specific	0.065	Forest dependent communities receive livelihood capacity building training that are climate resilient and reduce their natural resource dependence.	Adaptation	Other (Health)			Ongoing	Public sector
Vietnam	2022, Information Technology (IT) Roadmap 2.0 Technical Assistance, Mitigation	0.94	This grant funds the Information Technology (IT) Roadmap 2.0 Technical Assistance for the National Power Transmission Corporation of Vietnam (EVNNPT) in Vietnam to modernize its IT systems. This technical assistance will help EVNNPT to develop a new enterprise architecture and IT roadmap to lead its deployment of modern smart grid technologies to meet the rapidly growing power transmission demand in Vietnam. The grant is anticipated to help mobilize $135 million in financing.	Mitigation	Energy			Ongoing	Public sector
Jamaica	2022, Jamaica Emergency Communications System Modernization Technical Assistance, Adaptation	0.74	This grant funds the Jamaica Emergency Communications System Modernization Technical Assistance for the Ministry of Science, Energy and Technology to support the development of a modernized and unified emergency communications system in Jamaica. The project would include the creation of a consolidated emergency communications system at the national level, as well as implementation of technological and operational upgrades to improve the country's emergency response capabilities. This technical assistance would support climate change adaptation by strengthening emergency response and	Adaptation	Cross-Cutting			Ongoing	Public sector

			communications capacity for climate-change related disasters such as severe storms and hurricanes, which disproportionately affect Caribbean islands. The grant is anticipated to help mobilize $26 million in financing.						
India	2022, Jharia Coal Mine Methane Project Feasibility Study, Mitigation	0.79	This grant funds the Jharia Coal Mine Methane Project Feasibility Study for Prabha Energy Private Limited (PEPL), a private Indian energy developer, to develop a coal mine methane (CMM) recovery project associated with metallurgic coal mining in the Jharia coalfield in eastern India. The feasibility study will help PEPL determine CMM availability in the coal block, design the drainage system, identify use cases for the captured gas, and assess potential financing sources and cost estimates. The grant is anticipated to help mobilize $103 million in financing.	Mitigation	Energy			Ongoing	Public sector
Global	2022, Malaria Database, Adaptation - Climate Specific	1.005	Funds will support the development and operationalization of a database to collect and analyze data streams relevant to the work of the President's Malaria Initiative. This mechanism will combine data from disparate sources, including meteorological data, malaria operational planning figures, and entomological data (such as mosquito density and insecticide resistance, etc.), as well as potential data from the Global Fund. The data will be used to help PMI and the global malaria community interpret data trends to assess the impact of interventions at a granular level and review unexpected trends in malaria cases real-time. By integrating precipitation data into malaria surveillance systems, partners can more efficiently time intervention campaigns and deploy needed commodities, mitigating the impact of climate change on malaria programs.	Adaptation	Other (Health)			Ongoing	Public sector

Ecuador	2022, Manabi Intelligent Transportation System (ITS) Modernization Technical Assistance, Adaptation	0.24	This grant funds the Manabi Intelligent Transportation System (ITS) Modernization Technical Assistance for the Provincial Government of Manabí in Ecuador. The technical assistance will help to modernize and integrate the road network in the Province of Manabí through the implementation of intelligent transportation system technologies. The grant is anticipated to help mobilize $40 million in financing.	Adaptation	Transport			Ongoing	Public sector
Mexico	2022, Mérida Intelligent Transportation System (ITS) Modernization Technical Assistance, Mitigation	0.88	This grant funds the Mérida Intelligent Transportation System (ITS) Modernization Technical Assistance for Mexico's Instituto de Movilidad y Desarrollo Urbano Territorial (IMDUT) to support the deployment of ITS technologies, to modernize the bus control and monitoring center, and to advance the transition to electric buses for the public transportation fleet in Mérida, the capital of the State of Yucatán. The technical assistance would support IMDUT's Integrated Transport System Project by providing recommendations for the selection of ITS and electric mobility solutions to modernize Mérida's public transportation system. The grant is anticipated to help mobilize $106 million in financing.	Mitigation	Transport			Ongoing	Public sector
Global	2022, Nutritional Data Services, Adaptation	5.815	The purpose of funding is to assist countries in implementing household and facility-based surveys, analyzing data stemming from these surveys, and facilitating the use of these data to support evidence-informed decision making. Project activities will also increase in-country individual and institutional capacity for identification of data needs and for survey design, management, and data collection to meet those needs. Having timely and reliable data on the nutritional practices	Adaptation	Other (Health)			Ongoing	Public sector

			and nutritional status of populations affected by the impacts of climate change will allow for context-specific adaptations to nutrition programming and policies.						
Philippines	2022, Offshore Wind and Battery Storage Project Feasibility Study, Mitigation	0.65	This grant for the Offshore Wind and Battery Storage Project Feasibility Study, funds a feasibility study for Aboitiz Renewables, Inc. (Aboitiz Renewables), a private renewable energy developer, to support the development of 3 GW of offshore wind turbine generation projects in the Philippines (Project). The feasibility study will identify potential Project sites, provide technical analysis and evaluate financing options to support clean energy deployment in the Philippines. This grant is anticipated to mobilize $13.6 billion in financing.	Mitigation	Energy			Ongoing	Public sector
Costa Rica	2022, Power Control Center Roadmap Technical Assistance, Mitigation	0.72	This grant funds the Power Control Center Roadmap Technical Assistance activity to develop a strategy and roadmap for Costa Rica’s national electricity provider, to create a power control center to monitor its generation, transmission, and distribution assets. This activity will also support Costa Rica's adaptation to climate change. The grant is anticipated to help mobilize $12 million in financing.	Mitigation	Energy			Ongoing	Public sector
Ghana	2022, Resiliency in Northern Ghana II - Systems Strengthening (Technical Assistance), Adaptation	0.2	This activity improves household nutrition and resilience within the Feed the Future zone of influence districts in northern Ghana by strengthening the capacity of public and private institutions to plan, finance, and implement solutions to malnutrition and food insecurity. The activity identifies and partners with strategic local partners and technical capacity building to promote positive nutrition behaviors and build household resilience in these communities. The activity promotes climate-smart	Adaptation	Other (Health)			Ongoing	Public sector

			technologies for nutrition-sensitive agriculture to build the resilience of vulnerable households.							
Ghana	2022, Resiliency in Northern Ghana II - Systems Strengthening (Technical Assistance), Mitigation	0.1	This activity improves household nutrition and resilience within the Feed the Future zone of influence districts in northern Ghana by strengthening the capacity of public and private institutions to plan, finance, and implement solutions to malnutrition and food insecurity. The activity identifies and partners with strategic local partners and technical capacity building to promote positive nutrition behaviors and build household resilience in these communities. The activity promotes climate-smart technologies for nutrition-sensitive agriculture to build the resilience of vulnerable households.	Mitigation	Other (Health)				Ongoing	Public sector
Ukraine	2022, Small Modular Reactor (SMR) Licensing Gap Analysis Technical Assistance, Mitigation	1.1	The objective of the TA is to support the State Nuclear Regulatory Inspectorate of Ukraine (SNRIU) in identifying gaps in its existing nuclear regulations as it relates to small modular reactor technologies. The grant is anticipated to mobilize $2.857 billion in financing.	Mitigation	Energy				Ongoing	Public sector
Bangladesh	2022, Smart Grid Roadmap Technical Assistance for Power Cell, Mitigation	1.49	This grant funds the Smart Grid Roadmap Technical Assistance for Power Cell, a Bangladesh government department responsible for power sector reform, to develop a roadmap for incorporating smart grid elements into Bangladesh’s electric grid (Project). The technical assistance would support the Project goals of improving the reliability, affordability, and resiliency of Bangladesh’s electricity grid by leveraging smart grid technologies. The grant is anticipated to help mobilize $7 billion in financing.	Mitigation	Energy				Ongoing	Public sector

Global	2022, Smart Utilities Promoting Energy Reform (SUPER), Mitigation	0.75	The Strengthening Utilities and Promoting Energy Reform (SUPER) Task Order (TO) aims to promote utility commercialization and equitable, effective reforms that will enhance the financial viability and long-term sustainability of developing countries' electricity systems and thereby enable their expansion and growth, and establish the necessary preconditions for additional private sector investments. Illustrative activities include capacity building and support for developing robust sector expansion plans; establishing legal, policy and institutional frameworks to support competitive private sector investment; assessing proposed power sector investments to ensure value-for-money and financial sustainability; integrating new technologies for improved commercial and technical performance; reducing losses and increasing revenues to increase power sector financial viability; and strengthening regulatory frameworks to improve transparency in power sector operations. The SUPER Task Order can help partner countries conduct data-driven planning and make informed investment decisions that avoid the risk of debt traps from unnecessary projects. Conducting transparent, competitive procurements can help deliver the greatest value-for-money and bring responsible, technically capable stakeholders to the table. Stronger commercial practices and regulatory frameworks help create a sustainable, rules-based approach to power sector development and operations, creating a stronger path to self-reliance. The TO will empower women and reduce gender gaps in the energy sector and across the value chain.	Mitigation	other			Ongoing	Public sector

Global	2022, SMART4TB, Adaptation	0.5	SMART4TB will identify more effective methods and tools for finding, treating, and preventing tuberculosis (TB) in 24 priority countries for TB programming. This initiative will build research capacity in high TB burden countries by supporting studies that evaluate novel approaches, interventions, and tools to combat TB-including diagnostic tests, new treatment drugs and regimens, socioeconomic and health system challenges, methods to interrupt TB transmission, and TB vaccines readiness and delivery. Through SMART TB, TB funds support climate change adaptation by investing in climate resilient research which include the assessment and identification of new environmentally friendly approaches, interventions, and tools that would have reduced environmental impact.	Adaptation	Other (Health)			Ongoing	Public sector
Global	2022, SMART4TB, Adaptation, first	1.125	SMART4TB will identify more effective methods and tools for finding, treating, and preventing tuberculosis (TB) in 24 priority countries for TB programming. This initiative will build research capacity in high TB burden countries by supporting studies that evaluate novel approaches, interventions, and tools to combat TB-including diagnostic tests, new treatment drugs and regimens, socioeconomic and health system challenges, methods to interrupt TB transmission, and TB vaccines readiness and delivery. Through SMART TB, TB funds support climate change adaptation by investing in climate resilient research which include the assessment and identification of new environmentally friendly approaches, interventions, and tools that would have reduced environmental impact.	Adaptation	Other (Health)			Ongoing	Public sector

St. Lucia	2022, Solar-Plus-Storage Microgrids Technical Assistance, Mitigation	0.67	This grant to the National Utilities Regulatory Commission (NURC) Solar-Plus-Storage Microgrids Technical Assistance, provides funding to support a technical assistance for the National Utilities Regulatory Commission (NURC) in Saint Lucia to develop six distributed solar-plus-storage microgrids for critical facilities on the island. The activity also supports St. Lucia in adaptating to climate impacts, such as enhanced hurricanes. The grant is anticipated to mobilize $18 million in financing.	Mitigation	Energy			Ongoing	Public sector
Asia Regional	2022, Southeast Asia Climate-Smart Transportation Reverse Trade Mission, Mitigation	0.49	This reverse trade mission (RTM) - the Southeast Asia Climate-Smart Transportation Reverse Trade Mission - brought delegates from Indonesia, Laos, Malaysia, the Philippines, Thailand, and Vietnam to the United States to familiarize them with state-of-the-art U.S. technologies, services, and best practices to improve the safety, efficiency, and sustainability of transportation infrastructure. The RTM focused on innovations that can support the decarbonization of the transportation sector, particularly at the city level, in Southeast Asia.	Mitigation	Transport			Ongoing	Public sector
Laos	2022, Southeast Asia Smart Power Program (Buy in), Mitigation	3	SPP will support Laos' efforts to export power to its ASEAN neighbors, including Vietnam, Thailand and Singapore. In Laos SPP will provide the technical assistance requested by the Laos Ministry of Energy and Mines under the Japan-U.S. Mekong Power Partnership, including capacity building on regulations and standards and grid interconnection guidelines and support to develop technical regulations and guidelines for solar, wind, and other variable renewable energy sources in order to increase clean energy exports to the region.	Mitigation	Energy			Ongoing	Public sector

Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Adaptation	0.67	The United States is providing assistance to support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Adaptation	Energy			Ongoing	Public sector
Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Adaptation, first	2	The United States is providing assistance to support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Adaptation	Energy			Ongoing	Public sector
Cambodia, Laos, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Mitigation	0.81	The United States is providing assistance to support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Mitigation	Energy			Ongoing	Public sector

Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Mitigation, Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2.67	The United States is providing assistance to support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Mitigation	Energy			Ongoing	Public sector
Cambodia, Laos, Thailand, Vietnam	2022, Southeast Asia Smart Power Program, Mitigation, first	1.11	The United States is providing assistance to the Southeast Asia Smart Power program through Deloitte Consulting LLP to support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Mitigation	Energy			Ongoing	Public sector
Global	2022, Supply Chain Technical Assistance, Mitigation, first	0.5	The FTF Livestock and Nutrition activity will provide technical assistance for capacity building of livestock farming communities to cope with climate shocks though adaptation of climate-smart technologies and practices such as production of saline and water-tolerant fodder varieties along the coastline of southern Bangladesh.	Mitigation	Other			Ongoing	Public sector
Global	2022, TB Data, Impact Assessment, and	0.3	The main objective of the TB DIAH Associate Award is to ensure optimal demand and analysis of TB data, and the appropriate use of such information to measure	Adaptation	Other (Health)			Ongoing	Public sector

	Communications (TB DIAH), Adaptation		performance and to inform National TB Program interventions and policies. The TB DIAH Associate Award will strengthen the capacity of TB decision makers to collect, analyze, and use quality information to scale up high-quality and sustainable TB services. These activities support the rollout and expansion of climate-friendly electronic TB information management systems the reduce the burden impact on the environment.						
Global	2022, Technical Assistance Facility to Mobilize Private Capital, Adaptation	3.8	FY 2022 funds to the TA facility will support rapidly accelerating the deployment of adaptation technologies, such as solar hydro panels that provide a sustainable source of clean water in water stressed communities, in low-income countries, and Small Island Developing States (SIDS). Additionally, TA facility market studies will identify the opportunity and need for specific climate resilience solutions. These studies will de-risk market entry into countries and make the successful introduction of solutions more likely; assist in scoping, evaluating, designing, and developing specific customer implementations or deployment projects in developing countries; and provide funding for first-of-a-kind pilot or seed projects that can then be subsequently scaled up without further support, such as providing first loss components for innovative finance mechanisms to apply climate resilience solutions.	Adaptation	Industry			Ongoing	Public sector
Uganda	2022, Uganda Agricultural Research Activity, Adaptation	0.5	The Uganda Agriculture Research activity aims to promote the development and dissemination of improved, nutritious food security crops. It focuses on improving crop genetics for increased yields and climate resilience, bio-fortification for nutritional value (Vitamin A in Sweet	Adaptation	Agriculture			Ongoing	Public sector

			potatoes and Banana) and management of aflatoxins , and integrated pest management. The activity consolidates past research efforts that developed a diverse array of near-ready crop varieties and will support the release and commercialization of the varieties to support food security and increased incomes. The activity is strengthening seed systems for commercial production and delivery of quality seed and other planting materials through youth and women groups. The activity is also strengthening public-private partnerships and market linkages for the different critical crops and other interlinking value chains to create a robust seed quality assurance and control system. In addition, working through the National Agricultural Research Organization (NARO), the activity is creating a pool of well-trained personnel with technical knowledge and skills to conduct conventional and modern biotechnology research. This will enhance NARO's institutional capacity to release and commercialize both conventional and biotechnology products and other production and post-harvest technologies. The activity will focus on 1) incubating technology and product prototypes and 2) market studies that will engage with different actors to establish which products, varieties, and technologies match market demands.						
Thailand	2022, VAO Energy Plastic Recycling Plant Feasibility Study, Mitigation	0.7	This grant funds the VAO Energy Plastic Recycling Plant Feasibility Study for VAO Energy Co., Ltd., a private energy developer, to develop a plastic recycling plant using pyrolysis in Thailand (Project). The purpose of this study is to select a pyrolysis technology and develop a continuous plastic recycling plant to process up to one hundred and fifty metric tons per day of plastic waste in Thailand and to	Mitigation	Industry			Ongoing	Public sector

			produce pyrolysis oil as a value-added product. The grant is anticipated to mobilize $75 million in financing.						
El Salvador	2022, Water Utility Energy Efficiency Technical Assistance, Mitigation	0.5	This grant funds the Water Utility Energy Efficiency Technical Assistance for El Salvador's National Administration of Aqueducts and Sewers (Administracion Nacional de Acueductos y Alcantarillados, ANDA), which will provide recommendations for efficiency measures that would lead to significant cost savings, develop a third-party financing model for the upgrades and energy efficiency projects, and explore the viability of onsite renewable power generation. This activity will support El Salvador's adaptation to climate change by improving the resilience of water utility operations. The grant is anticipated to help mobilize $98 million in financing.	Mitigation	Energy			Ongoing	Public sector
Global	2021, SilvaCarbon, Mitigation	0.666	SilvaCarbon, a flagship multi-agency technical assistance program, enhances the national inventory Measurement, Reporting, and Verification (MRV) systems capacity of strategic partner countries, improving their ability to monitor forest carbon and report on forests, landscapes, and other sectors. Support for the SilvaCarbon program assists key partner countries in improving their international reporting, land management planning, and ability to access results-based payments programs (including the LEAF Coalition). The program conducts trainings and workshops, provides technical assistance, develops tools, and fosters regional and international exchanges to encourage south-south cooperation.	Mitigation	Energy			Ongoing	Public sector
Global	2022, Global Fertilizer Challenge, Mitigation	25	The goal of the Global Fertilizer Challenge is to address food and fertilizer prices which have increased up to 40% in some regions, significantly exacerbating food insecurity globally. These price increases add pressure to strained food and fertilizer supply chains that were already buffeted	Mitigation	Cross-cutting		NR	Ongoing	Public sector

			by the combined effects of the pandemic and climate-related impacts. Inability to access fertilizer hampers agricultural productivity in many low-income countries, raising the deeply concerning prospect of decreased production and food shortages. Globally there is inefficiency in fertilizer use, including among wealthier countries, with estimates showing that more than 50 percent of fertilizer does not reach the intended crop due to several factors including overapplication. The Challenge establishes a framework for international cooperation to support innovative research, tailoring existing solutions to local conditions, demonstrations, and extension to enable the adoption of efficient nutrient management and alternative fertilizers and cropping systems in settings where both fertilizer usage and loss are high. By enhancing the efficiency of fertilizer use, the Challenge has the potential to stretch existing supplies of fertilizer and reduce the threat of global fertilizer shortages and high prices to food security.						

Activities that Contribute to Capacity Building Objectives

This table covers MPG paragraph 129.

This table is a representative sample, but does not represent the comprehensive list of all U.S. funded activities that contribute to capacity building objectives.

Recipient	Title of the Project Program, Activity or Other	Estimated Amount (USD millions)	Description and Objectives	Type of Support	Status of Measure or Activity	Year
Global	2021, Center for International Forestry –	0.15	The purpose of this agreement with CIFOR-ICRAF is to allow the United States to contribute to multi-donor supported, policy-relevant research projects led by CIFOR-ICRAF. These research project areas	Mitigation	Ongoing	2021

	World Agroforestry (CIFOR-ICRAF) Research Partnership, Mitigation		include, but are not limited to: 1) The Sustainable Wetlands Adaptation and Mitigation Program (SWAMP), which provides critical data on tropical wetlands in support of country-led efforts on wetland conservation and restoration for climate change mitigation and adaptation; 2) Sustainable landscapes and livelihoods, which explores the complex relationships between forests, nutrition, food security and the biological diversity that is critical to our planet's survival; 3) Soil health, which provides robust and actionable research on soil and land health, with a focus on soils' ability to sequester carbon, store and regulate water and nutrients, and provide ecosystem services; and 4) Forest and landscape restoration, which develops the evidence, tools, and analysis countries need to help landscapes recover and thrive.			
Global	2021, Center for International Forestry Research (CIFOR) Biodiversity Research, Mitigation	0.4	The Center for International Forestry Research (CIFOR) conducts policy-relevant research that improves our understanding of the role of forests and wildlife for food security. CIFOR will seek options to reduce the unsustainable consumption of wild meat, understand the environmental dimensions of zoonotic disease transmission like the SARS-CoV-2 virus, and partner with agriculture and nutrition partners to demonstrate integrated ways to improve nutrition status and farm productivity. CIFOR will continue to provide training on forestry and food security topics to local communities, practitioners, students, and government officials. CIFOR will also support graduate students from developing countries, nurturing the next generation of conservation and development leaders. Finally, CIFOR's research will contribute to forestry and biodiversity policy development as it relates to food security at the international, national, and provincial levels.	Mitigation	Ongoing	2021
Peru	2021, CINCIA ACIERTA: Alliance for Science & Ecosystem Recovery, Adaptation	0.3	The Center for Amazonian Scientific Innovation (CINCIA) promotes cutting-edge research programs to better understand the breadth and concentration of mercury pollution in Madre de Dios and Loreto, test various and innovative reforestation and restoration methodologies and plant species and improve geospatial analysis of deforested mining areas using drones.	Adaptation	Ongoing	2021
Peru	2021, CINCIA ACIERTA: Alliance for Science & Ecosystem Recovery, Mitigation	0.9	The Center for Amazonian Scientific Innovation (CINCIA) promotes cutting-edge research programs to better understand the breadth and concentration of mercury pollution in Madre de Dios and Loreto, test various and innovative reforestation and restoration methodologies and plant species and improve geospatial analysis of deforested mining areas using drones.	Mitigation	Ongoing	2021
Peru	2021, Combatting Environmental Crimes in the	2.8	Through this activity, the United States provides specialized technical assistance, training, and other services to strengthen the institutional capacity of key Peruvian institutions and actors, leading to	Mitigation	Ongoing	2021

	Peruvian Amazon, Mitigation, first		effective prevention, detection and sanctioning of environmental crimes. With an integrated multi-agency approach, this activity will strengthen the Government of Peru's capacity to design and implement policies, laws, and regulations that effectively prevent, detect and sanction environmental crimes to reduce deforestation and forest degradation and other forest crimes. The United States will also engage civil society organizations, including indigenous communities, to develop their capacity to prevent, monitor, and report environmental crimes in support of conservation goals. It will also strengthen community oversight capacity to patrol protected areas and support innovations, including new technologies aimed at reducing threats, with the engagement of the private sector.			
Uganda	2021, Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot, Adaptation	0.111	Through its Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot Activity (FTF Nafoore Warsaaji), the United States is providing assistance through Connexus Corp to small-scale farmers, including women in market gardening activities and women producer groups. The assistance aims to commercialize horticulture opportunities for rural farmers through bundling packages of technology and technical support services in Senegal. The activity increases smallholder farmers' resilience to weather and climate-related risks by linking farmers to climate information services for decision-making and advisory support.	Adaptation	Ongoing	2021
Uganda	2021, Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot, Mitigation	0.111	Through its Commercializing Horticulture - Small Business Applied Research (SBAR) Pilot Activity (FTF Nafoore Warsaaji), the United States is providing assistance through Connexus Corp to small-scale farmers, including women in market gardening activities and women producer groups. The assistance aims to commercialize horticulture opportunities for rural farmers through bundling packages of technology and technical support services in Senegal. The activity increases smallholder farmers' resilience to weather and climate-related risks by linking farmers to climate information services for decision-making and advisory support.	Mitigation	Ongoing	2021
Global	2021, Forest Data Partnership, Mitigation	1.5	The Forest Data Partnership is a partnership between the U.S. government, the World Resources Institute, Unilever, Google, and the United Nations Food and Agriculture Organization that will address a key barrier to private investment in forests and restoration - the lack of reliable and accessible data on forests and lands. These funds will be combined with existing programs and further enhance the Forest Data Partnership’s efforts to: align with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel	Mitigation	Ongoing	2021

			datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions. This approach will establish the enabling conditions to achieve full traceability, transparency and accountability in key commodity supply chains and restoration initiatives in a cost-effective manner.			
Bangladesh	2021, FTF Climate Smart Agriculture Activity, Adaptation- Climate Specific	1.1	The FTF Bangladesh Climate Smart Agriculture activity will improve smallholder farm household income, nutrition, and climate resilience by transforming rice-based agriculture into more diversified farming systems through climate smart agriculture (CSA) technologies.	Adaptation	Ongoing	2021
Global	2021, Low Emission Development Strategies Global Partnership (LEDS-GP), Mitigation	2.5	The LEDS-GP currently serves as a central global initiative for advancing technical work on low emissions strategies in key sectors. Funding for LEDS-GP will support regional and global collaborative efforts to transition key sectors to resilient and to zero emissions models, building capacity for technical experts and policymakers. This will also support the burgeoning global effort to transform this network to a more ambitious “net zero coalition.” The United States launched the LEDS Partnership in 2011 and it now has grown to 150 partners and serves as a forum for thousands of climate officials and practitioners to engage in regional and global initiatives that advance climate action and ambition.	Mitigation	Ongoing	2021
Africa Regional	2021, SERVIR West Africa 2 (Follow-on to SERVIR WA), Adaptation	0.833	This buy-in to SERVIR West Africa will provide Resilience in the Sahel Enhanced (RISE) II with tailored access to ongoing data and geospatial imaging services under development by the SERVIR WA consortium institutions with support from the United States. SERVIR WA informs and trains regional and national institutions on environmental issues and sustainable land and resource management by putting data into the hands of decision-makers in West Africa and serves as a regional hub for geospatial technology and analyses dissemination. Funds will be used to develop demand-driven services using geospatial data in the priority countries of Burkina Faso and Niger, with the potential to further scale across West Africa to address development problems in food security and agriculture, water and water-related disasters, climate and weather, and land cover/land use change. SERVIR WA provides a local principal investigator to work with U.S. university grantees on three applied sciences grants to improve the awareness, access and use of observation techniques by local, national, and regional institutions and governments and to build their capacity to provide	Adaptation	Ongoing	2021

			user-tailored services to address development challenges. Buy-in will be primarily focused on demand-driven services using geospatial data. These services include but will not be limited to groundwater monitoring, commune mapping and natural resources management, and surface water/flood risk mapping services. By building the capacity of local and regional institutions, this activity, working in tandem with TerresEauVie and other RISE II activities, will enhance the journey to self-reliance of local partners to assess and manage their natural resources and related risks for long-term prosperity.			
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Adaptation	0.315	The U.S. is providing assistance to the SERVIR Southeast Asia program through the Asian Disaster Preparedness Center to promote the use of satellite data and climate models among Southeast Asian countries in order to strengthen climate resilience, prepare for and respond to disasters, and other enivormental challenges including natural resources management, food security and air pollution.	Adaptation	Ongoing	2021
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Adaptation, first	0.585	The U.S. is providing assistance to the SERVIR Southeast Asia program through the Asian Disaster Preparedness Center to promote the use of satellite data and climate models among Southeast Asian countries in order to strengthen climate resilience, prepare for and respond to disasters, and other enivormental challenges including natural resources management, food security and air pollution.	Adaptation	Ongoing	2021
Cambodia, Indonesia, Laos, Burma, Philippines, Thailand, Vietnam	2021, SERVIR-Mekong II SERVIR Southeast Asia, Mitigation	0.1	The U.S. is providing assistance to the SERVIR Southeast Asia program through the Asian Disaster Preparedness Center to promote the use of satellite data and climate models among Southeast Asian countries in order to strengthen climate resilience, prepare for and respond to disasters, and other enivormental challenges including natural resources management, food security and air pollution.	Mitigation	Ongoing	2021
Global	2021, SEVIR Activity, Mitigation	0.65	SERVIR connects space to village by helping developing countries use information provided by Earth observing satellites and geospatial technologies to address critical challenges in food security, water resources, weather and climate, land use, natural disasters, and air quality. A partnership of leading technical organizations around the world, SERVIR works with partners to co-develop innovative solutions to improve livelihoods and foster self-reliance in Asia, Africa, and the Americas. The U.S. government provides science and geospatial technology support and coordination to five regional hub organizations across the SERVIR network.	Mitigation	Ongoing	2021

			The SERVIR SCO will continue to provide key science and technical support and coordination to the SERVIR network, respond to SERVIR hub needs, including direct science support, geospatial information technology support, and scientific oversight, technical backstopping and integration in support of activities for the new Applied Sciences Team (a set of 20 researchers from US institutions that collaborate with hubs to design and implement demand-driven services), and subject matter experts to support Amazonia and West Africa hub activities. The SCO will support in delivering on four strategic results: 1) Building regional and national capacity and commitment to use science and technology; 2) Delivering impactful solutions to build resilience and address food security challenges; 3) Enabling the agency to tell impact stories with remote sensing tools; and 4) Providing global thought leadership and influence in use of Earth observation to advance development goals and build local capacity and country self-reliance.			
Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Chad, Côte D'Ivoire, Djibouti, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Togo, Tanzania, Uganda, Zambia	2021, SEVIR African Regional Data Hub Funding, Adaptation	1.63	Through SERVIR, the U.S. government is providing assistance through the Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi, Kenya, and the Agrometeorology, Hydrology and Meteorology Regional Center, in Niamey, Niger and its regional consortium partners. The assistance will increase access to information and analyses to help people in sub-Saharan Africa address critical challenges in climate change, food security, water and related disasters, land use, and air quality. Partnering with these regional hub organizations, the SERVIR Science Coordination Office (SCO) and Applied Sciences Teams (AST) subject matter experts develop user-focused geospatial information services, including training, products, and tools, improving capacity of regional institutions to develop local solutions.	Adaptation	Ongoing	2021
Global	2021, Smart Utilities Promoting Energy Reform (SUPER), Mitigation	0.361	The Strengthening Utilities and Promoting Energy Reform (SUPER) Task Order (TO) aims to promote utility commercialization and equitable, effective reforms that will enhance the financial viability and long-term sustainability of developing countries' electricity systems and thereby enable their expansion and growth, and establish the necessary preconditions for additional private sector	Mitigation	Ongoing	2021

			investments. Illustrative activities include capacity building and support for developing robust sector expansion plans; establishing legal, policy and institutional frameworks to support competitive private sector investment; assessing proposed power sector investments to ensure value-for-money and financial sustainability; integrating new technologies for improved commercial and technical performance; reducing losses and increasing revenues to increase power sector financial viability; and strengthening regulatory frameworks to improve transparency in power sector operations. The SUPER Task Order can help partner countries conduct data-driven planning and make informed investment decisions that avoid the risk of debt traps from unnecessary projects. Conducting transparent, competitive procurements can help deliver the greatest value-for-money and bring responsible, technically capable stakeholders to the table. Stronger commercial practices and regulatory frameworks help create a sustainable, rules-based approach to power sector development and operations, creating a stronger path to self-reliance. The TO will empower women and reduce gender gaps in the energy sector and across the value chain.			
Cambodia, Indonesia, Laos, Philippines, Thailand, Vietnam	2021, Southeast Asia Smart Power Program, Mitigation	0.8	Support countries in Southeast Asia to mobilize investment and expand market opportunities to accelerate clean energy transition through utility modernization, increasing deployment of advanced energy systems, promoting transparent, best value procurement, and enhancing regional energy trade and integration. The program will also help the power sector to address power system vulnerability to climate impacts and improve resilience of the system through adaptation solutions.	Mitigation	Ongoing	2021
Global	2021, Technical Assistance Facility to Mobilize Private Capital (CRAFT), Adaptation	2.5	Funds will support rapidly accelerating the deployment of adaptation technologies, such as solar hydro panels that provide a sustainable source of clean water in water stressed communities, in low-income countries, and Small Island Developing States (SIDS). Additionally, TA facility market studies will identify the opportunity and need for specific climate resilience solutions. These studies will de-risk market entry into countries and make the successful introduction of solutions more likely; assist in scoping, evaluating, designing, and developing specific customer implementations or deployment projects in developing countries; and provide funding for first-of-a-kind pilot or seed projects that can then be subsequently scaled up without further support, such as providing first loss components for innovative finance mechanisms to apply climate resilience solutions.	Adaptation	Ongoing	2021

Uganda	2021, Uganda Agricultural Research Activity, Adaptation	0.05	The Uganda Agriculture Research activity aims to promote the development and dissemination of improved, nutritious food security crops. It focuses on improving crop genetics for increased yields and climate resilience, bio-fortification for nutritional value (Vitamin A in Sweet potatoes and Banana) and management of aflatoxins , and integrated pest management. The activity consolidates past research efforts that developed a diverse array of near-ready crop varieties and will support the release and commercialization of the varieties to support food security and increased incomes. The activity is strengthening seed systems for commercial production and delivery of quality seed and other planting materials through youth and women groups. The activity is also strengthening public-private partnerships and market linkages for the different critical crops and other interlinking value chains to create a robust seed quality assurance and control system. In addition, working through the National Agricultural Research Organization (NARO), the activity is creating a pool of well-trained personnel with technical knowledge and skills to conduct conventional and modern biotechnology research. This will enhance NARO's institutional capacity to release and commercialize both conventional and biotechnology products and other production and post-harvest technologies. The activity will focus on 1) incubating technology and product prototypes and 2) market studies that will engage with different actors to establish which products, varieties, and technologies match market demands.	Adaptation	Ongoing	2021
Africa Regional	2021, Weather and Climate Information Services Activity, Adaptation	0.857	The Weather and Climate Information Services (WCIS) Activity will build off Senegal's previous efforts, backed by U.S. investments, to support farmers, herders and fishers to better understand, communicate and effectively use WCIS when making business decisions in the face of climate variability and change. It will boost the development of the WCIS value chain and the design of user-centered products by helping the National Agency for Civil Aviation and Meteorology's (ANACIM) better engage with private sector distributors for the quality delivery of downscaled, timely, and differentiated fee-based products and services. Toward the ultimate goal of a successful value chain development, the activity will lead policy efforts that reinforce the enabling environment for Public-Private Partnerships (PPPs) and working business models. Funds will support ANACIM to strengthen its capacity to produce diversified, tailored and downscaled WCIS responsive to climate variability and change. ANACIM and private sector providers will be better able to develop and operationalize effective PPPs to co-create new	Adaptation	Ongoing	2021

			WCIS. The U.S. will also support the Government of Senegal to improve the regulatory framework governing PPPs, as well as helping private sector actors improve their access to capital and develop market linkages. These investments will result in farmers, pastoralists, and fisherfolks having an increased willingness to pay for WCIS, and increased access to improved WCIS products at an attractive price.			
Philippines	2022, Amacan Geothermal Project Feasibility Study, Mitigation	0.41	This grant for the Amacan Geothermal Project Feasibility Study, funds a feasibility study for Energy Development Corporation (EDC), a private energy developer, to support the development of a geothermal power generation plant in Amacan in the island of Mindanao in the Philippines. The feasibility study will provide a geothermal resource assessment, preliminary site selection and development, technology assessment, interconnection analysis and design, financial analysis, regulatory review, a preliminary environmental and social assessment, and an implementation plan to support clean energy in the Philippines. This grant is anticipated to mobilize $288 million in financing.	Mitigation	Ongoing	2022
Global	2022, Center for International Forestry – World Agroforestry (CIFOR-ICRAF) Research Partnership, Mitigation	0.35	The activity will engage in partnerships with community conservancies, the Narok County Government, civil society organizations, and tourism partners to co-create integrated locally-led conservation and cross-sectoral development approaches. Interventions will target biodiversity conservation, tourism, gender and youth, health, agriculture and nutrition, water, education, plastic management, and climate resilience sectors.	Mitigation	Ongoing	2022
Uganda	2022, Country Health Information Systems and Data Use (CHISU), Adaptation, Uganda - Climate Specific	0.5	Strengthen data collection and use at the national, district and sub-district chiefdom levels. PMI will support the collection, reporting, and use of routine malaria data, through capacity building of malaria focal persons, monitoring and evaluation teams, and community health officers to collect, analyze and report quality malaria data using the national District Health Information System. The data collected is used to investigate the health impacts of climate change, or vulnerability or resilience to climate change impacts.	Adaptation	Ongoing	2022
Africa Regional	2022, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation - Climate Specific	0.065	Forest dependent communities receive livelihood capacity building training that are climate resilient and reduce their natural resource dependence.	Adaptation	Ongoing	2022

India	2022, Jharia Coal Mine Methane Project Feasibility Study, Mitigation	0.79	This grant funds the Jharia Coal Mine Methane Project Feasibility Study for Prabha Energy Private Limited (PEPL), a private Indian energy developer, to develop a coal mine methane (CMM) recovery project associated with metallurgic coal mining in the Jharia coalfield in eastern India. The feasibility study will help PEPL determine CMM availability in the coal block, design the drainage system, identify use cases for the captured gas, and assess potential financing sources and cost estimates. The grant is anticipated to help mobilize $103 million in financing.	Mitigation	Ongoing	2022
Philippines	2022, Offshore Wind and Battery Storage Project Feasibility Study, Mitigation	0.65	This grant for the Offshore Wind and Battery Storage Project Feasibility Study, funds a feasibility study for Aboitiz Renewables, Inc. (Aboitiz Renewables), a private renewable energy developer, to support the development of 3 GW of offshore wind turbine generation projects in the Philippines (Project). The feasibility study will identify potential Project sites, provide technical analysis and evaluate financing options to support clean energy deployment in the Philippines. This grant is anticipated to mobilize $13.6 billion in financing.	Mitigation	Ongoing	2022
Global	2022, SMART4TB, Adaptation, first	1.125	SMART4TB will identify more effective methods and tools for finding, treating, and preventing tuberculosis (TB) in 24 priority countries for TB programming. This initiative will build research capacity in high TB burden countries by supporting studies that evaluate novel approaches, interventions, and tools to combat TB-including diagnostic tests, new treatment drugs and regimens, socioeconomic and health system challenges, methods to interrupt TB transmission, and TB vaccines readiness and delivery. Through SMART TB, TB funds support climate change adaptation by investing in climate resilient research which include the assessment and identification of new environmentally friendly approaches, interventions, and tools that would have reduced environmental impact.	Adaptation	Ongoing	2022
Laos	2022, Southeast Asia Smart Power Program (Buy in), Mitigation	3	SPP will support Laos' efforts to export power to its ASEAN neighbors, including Vietnam, Thailand and Singapore. In Laos SPP will provide the technical assistance requested by the Laos Ministry of Energy and Mines under the Japan-U.S. Mekong Power Partnership, including capacity building on regulations and standards and grid interconnection guidelines and support to develop technical regulations and guidelines for solar, wind, and other variable renewable energy sources in order to increase clean energy exports to the region.	Mitigation	Ongoing	2022

Global	2022, Supply Chain Technical Assistance, Mitigation, first	0.5	The FTF Livestock and Nutrition activity will provide technical assistance for capacity building of livestock farming communities to cope with climate shocks though adaptation of climate-smart technologies and practices such as production of saline and water-tolerant fodder varieties along the coastline of southern Bangladesh.	Mitigation	Ongoing	2022
Uganda	2022, Uganda Agricultural Research Activity, Adaptation	0.5	The Uganda Agriculture Research activity aims to promote the development and dissemination of improved, nutritious food security crops. It focuses on improving crop genetics for increased yields and climate resilience, bio-fortification for nutritional value (Vitamin A in Sweet potatoes and Banana) and management of aflatoxins , and integrated pest management. The activity consolidates past research efforts that developed a diverse array of near-ready crop varieties and will support the release and commercialization of the varieties to support food security and increased incomes. The activity is strengthening seed systems for commercial production and delivery of quality seed and other planting materials through youth and women groups. The activity is also strengthening public-private partnerships and market linkages for the different critical crops and other interlinking value chains to create a robust seed quality assurance and control system. In addition, working through the National Agricultural Research Organization (NARO), the activity is creating a pool of well-trained personnel with technical knowledge and skills to conduct conventional and modern biotechnology research. This will enhance NARO's institutional capacity to release and commercialize both conventional and biotechnology products and other production and post-harvest technologies. The activity will focus on 1) incubating technology and product prototypes and 2) market studies that will engage with different actors to establish which products, varieties, and technologies match market demands.	Adaptation	Ongoing	2022
Thailand	2022, VAO Energy Plastic Recycling Plant Feasibility Study, Mitigation	0.7	This grant funds the VAO Energy Plastic Recycling Plant Feasibility Study for VAO Energy Co., Ltd., a private energy developer, to develop a plastic recycling plant using pyrolysis in Thailand (Project). The purpose of this study is to select a pyrolysis technology and develop a continuous plastic recycling plant to process up to one hundred and fifty metric tons per day of plastic waste in Thailand and to produce pyrolysis oil as a value-added product. The grant is anticipated to mobilize $75 million in financing.	Mitigation	Ongoing	2022
Mexico	2021, Centro de Formación Integral para Promotores	0.01	Centro de Formación Integral para Promotores Indígenas, A.C. (CEFIPI) is coordinating with Tseltal communities in Chiapas to implement a cross-cutting training program to improve skills in managing	Adaptation	Ongoing	2021

	Indígenas, A.C. (CEFIPI) Cross-Cutting Training Program in Mexico, Adaptation		community development and sustainable smallholder agriculture. CEFIPI's activities strengthen grassroots communities through education and training and they build peer-to-peer learning.			
Botswana	2021, Climate Smart Agriculture Research in Botswana, Adaptation-Climate Specific	0.06	Supports an agricultural scientist from Botswana to address Climate Smart Agriculture and food systems research by establishing an integrated nutrient management and conservation practice for a semi-arid conditions and evaluating the feasibility of implementing nutrient decision tool(s) on the most prevalent crop systems in Botswana.	Adaptation	Ongoing	2021
Philippines	2021, Climate Smart Agriculture Research in the Philippines, Adaptation-Climate Specific	0.05	Supports an agricultural scientist from the Philippines to improve understanding of Climate Smart Agriculture and food systems research by studying the interaction between farmer risk tolerance and adoption of CSA strategies and providing actionable policy recommendations	Adaptation	Ongoing	2021
Zambia	2021, Climate-Smart Dairy Production Research in Zambia, Adaptation	0.06	Supports research on 'climate-smart dairy production', focusing specifically on developing improved monitoring and diagnostic tools for vector-borne infectious animal disease surveillance in situations when herds may be exposed to conditions of increased flooding and prolonged periods of standing water	Adaptation	Ongoing	2021
Mozambique	2021, Construction of a Research and Conservation Center, Mitigation	1	As part of an overall biodiversity development strategy in Liberia, the United States identified the need for an on-site institution that houses conservation and research staff and brings together subject matter experts and field practitioners interested in conducting research and sharing information about the sustainability of and the ongoing challenges with monitoring a Protected Area. The United States plans to construct a research and conservation center at a proposed Protected Area (PPA) - likely the Krahn Bassa PPA - to host staff from international and domestic conservation and research organizations. The research center will anchor efforts to conduct biodiversity surveys and other work necessary to support the official recognition of the PPA. The proposed conservation and research center will serve as a hub of Liberian subject matter experts on PPA management and biodiversity, and will utilize renewable energy sources to minimize its impact on the surrounding areas.	Mitigation	Ongoing	2021

			The United States will support the creation of a conservation and research center which will provide several functional spaces for conservation and research experts and include office and meeting spaces and basic laboratory facilities.			
Peru	2021, Corn Research in Peru, Adaptation	0.06	Supports a researcher from Peru to use new biotechnologies to breed Peruvian corn varieties that can help adapt them to the anticipated biotic and abiotic stresses of climate change	Adaptation	Ongoing	2021
Trinidad and Tobago	2021, Crop Virus Research in Trinidad and Tobago, Adaptation	0.06	Supports a researcher from Trinidad and Tobago to conduct a research training in integrating genomic virology and cacao genotyping approaches to establish molecular virus diagnostics for virus surveillance of the germplasm collection and on farms and increase existing genotyping (SSRs) capacity to identify virus-free, virus-resistant, and heat-tolerant genotypes. This collaboration with CG-CRC will build upon previous research and training collaborations.	Adaptation	Ongoing	2021
Nigeria	2021, DayStar Commercial and Industrial Distributed Energy Resources Feasibility Study in Nigeria, Mitigation	1	This grant funds the DayStar Commercial and Industrial Distributed Energy Resources Feasibility Study to develop grid-connected distributed energy resources to optimize energy supply to 20 commercial and industrial entities in Nigeria. This grant is anticipated to mobilize $51 million in financing.	Mitigation	Ongoing	2021
India	2021, Dwarka Hybrid Renewables and Energy Storage Project Feasibility Study in India, Mitigation	0.84	This grant funds the Dwarka Hybrid Renewables and Energy Storage Project Feasibility Study for Shivman Wind Energy Private Limited to support the development of a 300-megawatt wind-solar-storage hybrid power plant located in the northwestern Indian state of Gujarat, the Dwarka Hybrid Renewables and Energy Storage Project. The project is expected to include wind generation capacity, solar photovoltaic generation, a battery energy storage system (BESS) and associated electricity transmission infrastructure. The proposed feasibility study would perform wind and solar photovoltaic energy resource assessments, develop the conceptual design of the BESS, and evaluate the Project costs. The grant is anticipated to help mobilize $540 million in financing.	Mitigation	Ongoing	2021
Nigeria	2021, EM-ONE Solar Mini-Grids Feasibility Study, Mitigation	0.98	This grant has funded the EM-ONE Solar Mini-Grids Feasibility Study to support the deployment of up to 150 solar hybrid mini-grid systems to provide affordable and reliable energy access to primary healthcare sites and their neighboring communities within Nigeria’s Bauchi, Ebonyi, Kebbi, and Sokoto states and in the federal capital territory. This feasibility study is anticipated to mobilize $94.2 million in financing.	Mitigation	Ongoing	2021

Africa Regional	2021, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation - Climate Specific	0.2	Forest dependent communities receive livelihood capacity building training that is climate resilient and reduces their natural resource dependence.	Adaptation	Ongoing	2021
Uganda	2021, Grain/Corn Storage Resilience Research in Uganda, Adaptation	0.06	Supports research to adapt grain/corn storage facilities to the higher anticipated temperatures associated with climate change, focusing on mitigating potential increases in aflatoxin contamination that could occur.	Adaptation	Ongoing	2021
Brazil	2021, Grassland Research in Brazil, Adaptation	0.06	Supports a researcher from Brazil in preserving and restoring grassland forb diversity to increase climate-resilient pastures and decrease rumen methane emissions. The researcher will gain critical information on biochemical composition (specifically condensed tannins) throughout the growing season.	Adaptation	Ongoing	2021
Liberia	2021, Higher Education for Conservation Activity, Mitigation	0.7	The United States is supporting the establishment of a Forestry, Biodiversity and Conservation (FBC) Center of Excellence at the University of Liberia in collaboration with a consortium of US and Liberian higher education institutions through the Higher Education for Conservation Activity (HECA). The FBC center will build natural resources management and climate adaptation capacity in Liberia through the creation of a national FBC curriculum and direct training of educators and students. HECA is a $5 million program implemented by the University of Georgia.	Mitigation	Ongoing	2021
Sierra Leone	2021, Hybrid Power Generation in Nitti Feasibility Study in Sierra Leone, Mitigation	0.55	This grant for the Hybrid Power Generation in Nitti Feasibility Study has funded a feasibility study to evaluate the technical, economic, environmental, and financial viability of a proposed 192 megawatt hybrid power generation plant near the village of Nitti in Sierra Leone. The grantee is the Sierra Leone Ministry of Energy. The feasibility study will assess how best to maximize the use of solar photovoltaic energy and provide reliable power generation. The feasibility study is anticipated to mobilize $295 million in financing. Approximately half of the grant will support clean energy (solar PV) deployment.	Mitigation	Ongoing	2021
Mexico	2021, La Pluma Utility-Scale Solar Feasibility Study in Mexico, Mitigation	0.79	This grant funds the La Pluma Utility-Scale Solar Feasibility Study to assess the technical, economic, and financial viability of developing a 100-megawatt solar power plant in western Mexico in the state of Michoacan by conducting site surveys and a technology assessment, finalizing the grid integration and conceptual designs, as well as conducting environmental, financial, and regulatory	Mitigation	Ongoing	2021

			analyses. The grantee is Mexican solar company ENERMUN S.A. de C.V. The grant is anticipated to help mobilize $106.7 million in financing.			
Pakistan	2021, Landhi Cattle Colony Biomethane Project Feasibility Study in Pakistan, Mitigation	0.6	This grant has funded a feasibility study for the Landhi Cattle Colony Biomethane Project to assist Times Group (Private) Limited, an engineering and construction company in Pakistan, to deploy anaerobic digester units to process cattle waste into biomethane and fertilizer. This feasibility study will help the Times Group evaluate the economic feasibility of the waste to biomethane project; develop technical specifications, designs, and plans; review and identify necessary permits; analyze the potential environmental and social impacts; and create an implementation plan for the Project. This grant is anticipated to mobilize $55 million in financing.	Mitigation	Ongoing	2021
Global	2021, LASER - Avoid the TRAP: Multi-sector collaboration between health, education and environment to minimize the impact of traffic-related air pollution (TRAP) on children in Ho Chi Minh City, Vietnam, 2021-2022, Adaptation - Climate Specific	0.134	LASER subaward project designed to study Multi-sector collaboration between health, education and environment to minimize effects of climate change	Adaptation	Ongoing	2021
Brazil	2021, Maize Plant Research in Brazil, Adaptation	0.06	Supports a researcher from Brazil to investigate the molecular and chemical interactions that occur between greenbug aphids (Schizaphis graminum), maize dwarf mosaic potyvirus (MDMV), and maize plants (Zea mays), in order to improve approaches to managing landscapes, including reduction of food loss and waste and sustainable materials management.	Adaptation	Ongoing	2021

Ghana	2021, Market Systems and Resilience Activity, Mitigation	0.2	The activity aims to strengthen markets by training farmers and other market actors to adopt improved agronomic and climate-smart agriculture practices such as irrigation, using improved seeds while also increasing the availability of nutrient-rich foods. MSR works with local SMEs to disseminate market information to smallholder farmers including information on weather, climate-smart activities, pest outbreak due to changes in weather, etc. These measures improve market information flows and increase the supply and demand for improved business services.	Mitigation	Ongoing	2021
Uganda	2021, Peace Corps (PC) Uganda Community Food Security, Health, and Education Capacity Building Activity, Adaptation-Climate Specific	0.05	The assistance will support the Peace Corps Volunteers to transfer new knowledge and skills in agriculture, health, and education programs to targeted Ugandan rural communities to improve their wellbeing.	Adaptation	Ongoing	2021
Guatemala	2021, Safe Return to School Plus, Mitigation	1	Assistance will build capacity among youth in the installation and maintenance of renewable energy infrastructure like solar panels. Renewable energy resources will be used to install solar panels in selected schools damaged during the 2020 hurricane season, and this will contribute not only to modernizing schools but also supporting a safe return to in-person learning.	Mitigation	Ongoing	2021
Global	2021, Sharing Environment and Energy Knowledge (SEEK), Adaptation	0.4	SEEK provides support in the areas of training, communication, knowledge management and organizational development. The project objectives are to: to improve staff knowledge, skills and abilities; support knowledge creation, capture and share knowledge internally and among a wide range of stakeholders; enhance communication and outreach to inform and engage key audiences using multiple approaches and channels; and strengthen organizational capacity for greater efficiency and learning for improved development impact. SEEK will support technical staff effectiveness in programming through knowledge management, communications, training and organizational development, assisting partner countries in their journey to self-reliance. Illustrative activities include a) supporting design and delivery of Biodiversity and Development 101 and 201 courses; b) supporting the planning and implementation of training and facilitation related to energy and infrastructure; and c) supporting a capacity building program and toolkit that assist in the implementation of the Global Water Strategy. Sustainable Landscapes (SL) funding will support Climatelinks and assess SL training needs of technical officers and developing training to address those needs. In addition to sharing lessons learned in SL programming via Climatelinks blogs, project	Adaptation	Ongoing	2021

			pages, and SL knowledge products, SEEK will support the SL team with facilitation and other organizational development support. Climatelinks will revamp SL resources to serve the information and knowledge management needs of officers and implementers designing and running SL programs.			
Global	2021, Sharing Environment and Energy Knowledge (SEEK), Mitigation	0.321	SEEK provides support in the areas of training, communication, knowledge management and organizational development. The project objectives are to: to improve staff knowledge, skills and abilities; support knowledge creation, capture and share knowledge internally and among a wide range of stakeholders; enhance communication and outreach to inform and engage key audiences using multiple approaches and channels; and strengthen organizational capacity for greater efficiency and learning for improved development impact. SEEK will support technical staff effectiveness in programming through knowledge management, communications, training and organizational development, assisting partner countries in their journey to self-reliance. Illustrative activities include a) supporting design and delivery of Biodiversity and Development 101 and 201 courses; b) supporting the planning and implementation of training and facilitation related to energy and infrastructure; and c) supporting a capacity building program and toolkit that assist in the implementation of the Global Water Strategy. Sustainable Landscapes (SL) funding will support Climatelinks and assess SL training needs of technical officers and developing training to address those needs. In addition to sharing lessons learned in SL programming via Climatelinks blogs, project pages, and SL knowledge products, SEEK will support the SL team with facilitation and other organizational development support. Climatelinks will revamp SL resources to serve the information and knowledge management needs of officers and implementers designing and running SL programs.	Mitigation	Ongoing	2021
Thailand	2021, Siam Cement Group (SCG) Fleet Decarbonization Project Feasibility Study in Thailand, Mitigation	0.74	This Siam Cement Group (SCG) Fleet Decarbonization Project Feasibility Study supports SCG International Corporation Co., Ltd. (SCG), one of the largest conglomerates in Thailand, develops a roadmap for the transition of their industrial and commercial fleet to electric vehicles (EVs). Specifically, the feasibility study provides a technical, financial, economic, and regulatory review of electrifying SCG's entire fleet of over 24,000 vehicles and developing EV charging infrastructure over 600 sites. The feasibility study also includes site assessments for three initially identified pilot project sites for SCG to implement at completion of the feasibility study and prove viability of	Mitigation	Ongoing	2021

			electrifying their logistics fleet, cement truck fleet, and taxis. The feasibility is anticipated to mobilize $8.8 billion in financing.			
Philippines	2021, Sun Keeper Utility-Scale Solar Project Feasibility Study, Mitigation	0.53	This grant, the Sun Keeper Utility-Scale Solar Project Feasibility Study, funds a feasibility study to support the development of four utility-scale solar generation plants totaling 70 megawatts in the Philippines. The Project supports the Sun Keeper Initiative, a solar implementation program developed by several electric cooperatives in the Philippines and the National Rural Electric Cooperative Association (NRECA) International. The Grantee is the Rural Electrification Finance Corporation (REFC), a corporation that is owned and operated by electric cooperatives in the Philippines and functions as a financier of electric cooperative infrastructure-related projects. This grant is anticipated to mobilize $62 million in financing.	Mitigation	Ongoing	2021
Indonesia	2021, Sustainable Energy for Indonesia's Advancing Resilience (SINAR), Mitigation	4.417	The United States will advance Indonesia's development goals in expanding reliable and equitable energy services necessary for sustainable development and inclusive economic growth. This project will achieve four objectives: 1) strengthen institutional framework and capacity to support energy sector transformation, 2) accelerate deployment of advanced energy systems, 3) improve utility performance, and 4) promote adoption of transparent-best value procurement. SINAR directly contributes to the Asia Enhancing Development and Growth through Energy (Asia EDGE) initiative and the goal of increasing economic engagement and prosperity through Indonesia's adoption of international best practices and policies that foster sustainable economic growth and innovation.	Mitigation	Ongoing	2021
West Bank and Gaza	2021, Technical and Vocational Education Training (TVET), Adaptation	0.25	The assistance will work with 12 technical and vocational institutes (TVET) across the West Bank, Gaza, and East Jerusalem to improve their performance, make facilities accessible and green, and develop relationships between the institutes and the private sector. These activities will introduce green skills to enable youth to consider the effects of climate change and introduce mitigation and adaptation measures in the industrial/service sector in which they will be working. The activity will also build the capacity of the targeted TVET institutions to adapt to the effects of climate change through the revision of their internal policies and regulations and introducing best practices in the area of climate change and environmental stewardship.	Adaptation	Ongoing	2021
India	2021, Water Management Research in India, Adaptation	0.06	Supports a researcher from India to improve understanding of land and water management techniques agricultural watershed to reduce carbon emissions and sequester carbon in the soil.	Adaptation	Ongoing	2021

West Bank and Gaza	2022, "Forsah" Technical and Vocational Education Training (TVET) Activity, Adaptation	0.2	The assistance will work with 12 technical and vocational institutes (TVET) across the West Bank, Gaza, and East Jerusalem to improve their performance, make facilities accessible and green, and develop relationships between the institutes and the private sector. These activities will introduce green skills to enable youth to consider the effects of climate change and introduce mitigation and adaptation measures in the industrial/service sector in which they will be working. The activity will also build the capacity of the targeted TVET institutions to adapt to the effects of climate change through the revision of their internal policies and regulations and introducing best practices in the area of climate change and environmental stewardship.	Adaptation	Ongoing	2022
Global	2022, Adaptation Training Center, Adaptation	9.5	As climate impacts increase in frequency and intensity around the world, and particularly in Africa, there is a need for well-trained professionals to plan and implement effective efforts to adapt to and manage these impacts. The Government of Egypt, as the Presidency of COP27, launched the Cairo Center for Learning and Excellence on Adaptation and Resilience (CCLEAR) to provide adaptation training for decision makers, particularly national, sub-national and local government officials in all relevant sectors. U.S. funding will help establish CCLEAR – currently planned to be hosted by the American University in Cairo – and catalyze investments from other donors. CCLEAR will work with African universities and central ministries to develop a robust, high-impact training curriculum that raises awareness of climate risks, strengthens capacity to apply adaptation solutions to manage those risks, and facilitates adaptation knowledge and technology transfer, especially for fiscal policy, budgeting, and planning.	Adaptation	Ongoing	2022
Bhutan	2022, Bhutan Economic and Education Support Activity (BEESA), Mitigation	0.3	Funds will support the Royal Government of Bhutan to build the capacity of local governments to select, appraise and implement clean energy projects. Energy networks have a high economic return, which is most likely to stimulate private sector economic activity.	Mitigation	Ongoing	2022
Global	2022, Building Global Regulatory Capacity Building on Decarbonization and Resilience, Mitigation	1	Assistance will provide regulatory support to priority countries around the world. Through the Power Sector Program (PSP) and peer-to-peer capacity building with U.S. regulatory experts, assistance will help establish independent regulators and support institutional development of those recently established. In addition, this program will facilitate clean energy and electric vehicle (EV) integration; improve distributed power generation regulations; strengthen competitive procurement to increase renewable energy; advise on grid codes and technical standards for clean energy and Battery Energy Storage Systems (BESS); and support cross-border interconnections and	Mitigation	Ongoing	2022

			power trade. Programming will also support gender equity and equality in energy decision-making and regulatory development.			
Global	2022, Center for International Forestry Research (CIFOR) Biodiversity Research, Mitigation	0.3	These research project areas include, but are not limited to: 1) The Sustainable Wetlands Adaptation and Mitigation Program (SWAMP), which provides critical data on tropical wetlands in support of country-led efforts on wetland conservation and restoration for climate change mitigation and adaptation; 2) Sustainable landscapes and livelihoods, which explores the complex relationships between forests, nutrition, food security and the biological diversity that is critical to our planet's survival; 3) Soil health, which provides robust and actionable research on soil and land health, with a focus on soils' ability to sequester carbon, store and regulate water and nutrients, and provide ecosystem services; and 4) Forest and landscape restoration, which develops the evidence, tools, and analysis countries need to help landscapes recover and thrive.	Mitigation	Ongoing	2022
Global	2022, Climate Action Partnership for Education (CAPE) Broad Agency Announcement (BAA), Mitigation	2	EDU- Climate Action Partnership for Education (CAPE) Broad Agency Announcement (BAA), will provide opportunities to co-create, co-design, co-invest, and collaborate in the research, development, piloting, testing and scaling of innovative and cost-effective solutions to advance climate action in and through education with a focus on girls' education.	Mitigation	Ongoing	2022
Pakistan	2022, Climate Smart Energy, Mitigation, first	2	Activity plans to work in climate mitigation and adaptation to support Ministry of Climate Change for implementing the NDCs and National Adaptation Plan. Technical assistance will help improve policy and regulatory framework for climate resilient infrastructure, review standard and SOPs and support where revisions needed. In addition provide support to private developers to develop climate resilient projects and help mobilize international direct investment for climate adaptation and mitigation projects.	Mitigation	Ongoing	2022
Benin	2022, Cotonou Entomological Research Center (CREC), Adaptation	0.825	CREC is providing assistance to achieve adaptation measures in terms of a climate adaptive approach through its assistance to Cotonou Entomological Research Center for intensified malaria research, including anti-microbial resistance investigation, for more insight and informed vector control programming.	Adaptation	Ongoing	2022
Romania	2022, FEED Study, Mitigation	8	The study will provide Romania with key site-specific data - cost, construction, schedule, and licensing details - necessary for the deployment of a NuScale VOYGR-6 SMR nuclear power plant. Once completed, the clean, innovative nuclear energy facility will create thousands of jobs and	Mitigation	Ongoing	2022

			accelerate Romania's clean-energy transition, while upholding the highest standards for nuclear safety, security, and nonproliferation. In demonstrating the viability of SMRs, Romania will help to incentivize additional investments in this technology, both as a means to accelerate transition to cleaner energy sources.			
Honduras	2022, Global Health Security Capacity Building, Adaptation - Climate Specific	0.168	This Activity will work with the Government of Honduras and a range of stakeholders to strengthen Honduras' capacity to prevent, detect and respond to infectious disease threats, including those that are linked or exacerbated by climate related threats and events.	Adaptation	Ongoing	2022
Africa Regional	2022, Global Health Supply Chain -Technical Assistance (GHSC-TA) - Task Order Francophone, Adaptation, first - Climate Specific	0.3	Forest dependent communities receive livelihood capacity building training that are climate resilient and reduce their natural resource dependence.	Adaptation	Ongoing	2022
Global	2022, Global Health Training, Advisory, and Support Contract (GHTASC), Adaptation, first - Climate Specific	0.985	The purpose of the Global Health Training, Advisory, and Support Contract (GHTASC) is to provide junior, mid-level, senior, and expert advisory and technical, administrative and operational, and training, professional development and organizational development institutional support contract services and resources. GHTASC will provide the professional services needed to support strategic programs and promote efficient and effective global health programming and operations. Partial attribution of funding will support 1 staff member in regards to a climate change-focused role including review of climate change strategy and policy, participation in climate change working groups, and development of climate change tools. In addition attribution includes partial level of effort from multiple staff members to advise on climate-related monitoring and adaptations for malaria programming.	Adaptation	Ongoing	2022
Rwanda	2022, Kigali Innovation Smart City Feasibility Study, Adaptation	0.16	A grant to the Rwanda Development Board for the Kigali Innovation Smart City Feasibility Study is funding a feasibility study that would assess (i) various options for deployment of smart city solutions at Kigali Innovation City, a planned mixed-use development intended to serve as a hub for the technology industry in Kigali, and (ii) the feasibility of further deployments of smart city technologies throughout Rwanda. The grant is anticipated to mobilize $54 million in financing.	Adaptation	Ongoing	2022

Rwanda	2022, Kigali Innovation Smart City Feasibility Study, Mitigation	0.2	A grant to the Rwanda Development Board for the Kigali Innovation Smart City Feasibility Study is funding a feasibility study that would assess (i) various options for deployment of smart city solutions at Kigali Innovation City, a planned mixed-use development intended to serve as a hub for the technology industry in Kigali, and (ii) the feasibility of further deployments of smart city technologies throughout Rwanda. The grant is anticipated to mobilize $54 million in financing.	Mitigation	Ongoing	2022
Global	2022, Knowledge SUCCESS, Adaptation	0.299	The Knowledge Success project promotes the use of knowledge management (KM), or the process of collecting and curating knowledge and connecting people to it so they can act effectively, within the global broader health community. Major activities include: managing and sustaining the global resource repository; brokering and supporting knowledge exchange and collaboration to facilitate knowledge use; and building sustainable capacity for knowledge sharing, collaboration, learning, and adaptation. Knowledge SUCCESS updates, maintains, and promotes the People-Planet Connection platform in collaboration with the BUILD project; Population, Health, and Environment (PHE) champions; and other partners to continue multisectoral work. This platform provides easy access to PHE resources and connects the global community working on cross-sectoral programming, including integrated climate change initiatives.	Adaptation	Ongoing	2022
El Salvador	2022, Light-Emitting Diode (LED) Streetlighting Feasibility Study, Mitigation	0.96	This grant funds the Light-Emitting Diode (LED) Streetlighting Feasibility Study for Organismo Promotor de Exportaciones e Inversiones de El Salvador (PROESA) to provide the site assessments, engineering, conceptual and financial analysis, and the preliminary design for a public-private partnership to install streetlighting along more than 500 kilometers of highway in El Salvador. The grant is anticipated to help mobilize $57.8 million in financing.	Mitigation	Ongoing	2022
Morocco	2022, Marrakech Smart Grid Feasibility Study, Mitigation	1.26	Funding for the Marrakech Smart Grid Feasibility Study to enable Régie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA), the Moroccan state-owned power distribution company of the Marrakech-Safi region, to transform its power distribution infrastructure through a smart grid project. The project would help RADEEMA reduce technical and non-technical losses in the Marrakech Grid, reduce the frequency and downtime of network outages, reduce the cost of operations and maintenance for RADEEMA and electricity costs to its customers, and permit the incorporation of additional solar and other renewable energy into the grid. The grant is anticipated to help mobilize $249 million in financing.	Mitigation	Ongoing	2022

Thailand	2022, One Health Workforce - Next Generation (Southeast Asia One Health University Network Transition Award), Adaptation - Climate Specific	0.15	The United States is providing assistance to the Southeast Asia One Health University Network to develop and strengthen Thailand's One Health workforce with the capacity to prepare, prevent, detect, and respond to infectious disease outbreaks and complex health challenges. This includes the skills and foundational knowledge to integrate climate change into adaptive health systems and to reduce population health vulnerabilities. Progress towards this goal will build the region's ability to effectively prevent, detect, and respond to emerging threats and infectious disease outbreaks.	Adaptation	Ongoing	2022
Philippines	2022, Ore-to-Nickel and Cobalt Processing Facility Feasibility Study, Mitigation	1.03	Funds a feasibility study to support Eramen Minerals Inc. (EMI) in assessing the viability of developing an ore-to-nickel and cobalt processing facility to produce battery grade precursor materials in the Philippines. EMI currently operates a nickel ore mining facility in Zambales Province and seeks to develop local capacity to produce approximately 20,000 metric tons of mixed hydroxide precipitate annually for sale as a battery precursor material. The Project would support the production of critical minerals that are key elements in the supply chain for batteries and energy storage systems. This grant is anticipated to mobilize $420 million in financing.	Mitigation	Ongoing	2022
Egypt	2022, Partnerships for Educational Progress, Adaptation	0.6	The United States is providing assistance to work with the Government of Egypt, higher education institutions, and public and private actors to design and implement innovative solutions to strengthen teaching and learning and improve facilities at Egyptian universities and enhance the role of higher education systems and higher education institutions in developing and strengthening climate change resilience and sustainability	Adaptation	Ongoing	2022
Tonga	2022, Power Sector Decarbonization Feasibility Study, Mitigation	1.49	This grant funds the Power Sector Decarbonization Feasibility Study for Tonga Power Limited (TPL), Tonga's sole government-owned power utility, to support decarbonization of the power sector in Tonga by improving efficiency and increasing renewable energy generation penetration in TPL's service area through the implementation of distributed energy resources (DERs). This feasibility study will help TPL determine suitable locations for DERs and establish project economics in support of Tonga's clean energy transition. The grant is anticipated to mobilize $328 million in financing.	Mitigation	Ongoing	2022
Somalia	2022, Professionalization and Education Activity, Adaptation, first - climate specific	0.05	Improve security for public service providers and accessibility to basic services, which are critical in times of drought and climatic events.	Adaptation	Ongoing	2022

Somalia	2022, Professionalization and Education Activity, Adaptation, second - climate specific	0.051	Improve security for public service providers and accessibility to basic services, which are critical in times of drought and climatic events.	Adaptation	Ongoing	2022
Laos	2022, Supporting High Education Quality Improvement Program in Lao PDR, Mitigation	1	The United States will invest in higher education programs that will develop the skills required by the next generation of technicians, engineers, and managers, who are tasked with growing Laos' clean energy mix and energy transition.	Mitigation	Ongoing	2022
Kenya	2022, Sustainable Conservation and Management of Maasai Mara Landscape, Mitigation	0.5	The activity will engage in partnerships with community conservancies, the Narok County Government, civil society organizations, and tourism partners to co-create integrated locally-led conservation and cross-sectoral development approaches. Interventions will target biodiversity conservation, tourism, gender and youth, health, agriculture and nutrition, water, education, plastic management, and climate resilience sectors.	Mitigation	Ongoing	2022
Democratic Republic Of The Congo	2022, Virunga Security and Technical Training, Mitigation	2	A program to build the baseline capacity of Congolese Institute for Nature Conservation (ICCN) rangers and Virunga National Park staff to stem poaching and transit of wildlife and timber products and support the advanced skills needed to disrupt the criminal networks profiting from these crimes.	Mitigation	Ongoing	2022
Africa Regional	2022, West Africa Power Pool 225 Kilovolt Côte d'Ivoire-Liberia Transmission Interconnection Project Feasibility Study, Mitigation	0.28	This grant funds the West Africa Power Pool 225 Kilovolt Côte d'Ivoire-Liberia Transmission Interconnection Project Feasibility Study for an approximately 650 kilometer 225 kilovolt transmission line from Côte d'Ivoire to Liberia and associated substation and distribution equipment. The feasibility study will be conducted in conjunction with New Partnership for Africa's Development - Infrastructure Project Preparation Fund, a facility within the African Development Bank that would fund the Project line route survey as well as the environmental and social impact assessment for the Project. This grant is anticipated to mobilize $260 million in financing.	Mitigation	Ongoing	2022
Africa Regional	2021, Alternatives to Charcoal, Mitigation	1.39	The activity will strengthen EAC's leadership and learning to effectively implement its mandate on conservation and management of transboundary natural resources in the region. EAC is the regional intergovernmental organization which drives the vision for regional integration amongst six countries; Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda. It has the authority to successfully harmonize regional policies and implement strategic approaches and regulation on	Mitigation	Ongoing	2021

			conservation of transboundary natural resources in the region. The activity will fund: (i) Strengthen EAC Secretariat, Lake Victoria Basin Commission (LVBC) and EAC member states' technical capacity to coordinate regional harmonization of policies, strategies and legal frameworks (ii) Enhance the use of scientific evidence in decision-making processes through regional technical working groups; (iii) Coordinate and convene regional multi-sectoral policy and learning platforms on conservation and sustainable development; (iv) Support EAC's technical capacity building in economic valuation of natural resources in East Africa; and (v) Improve regional and bilateral collaboration and information sharing on the reduction of wildlife poaching and trafficking, law enforcement and prosecution of wildlife crimes.			
Global	2021, Climate Fellows, Mitigation	1.5	This program, which has supported five former and current fellows since 2014, places a technical expert in a host country's government (e.g., Ministry of Forests) to provide technical support on one or more priority forest mitigation, monitoring, and reporting projects, while improving in-country capacity. The Climate Fellow may also support regional capacity building efforts in forest mitigation, monitoring, and reporting through workshops and trainings.	Mitigation	Ongoing	2021
Peru	2021, Combatting Environmental Crimes in the Peruvian Amazon, Adaptation	0.35	Through this activity, the United States provides specialized technical assistance, training, and other services to strengthen the institutional capacity of key Peruvian institutions and actors, leading to effective prevention, detection and sanctioning of environmental crimes. With an integrated multi-agency approach, this activity will strengthen the Government of Peru's capacity to design and implement policies, laws, and regulations that effectively prevent, detect and sanction environmental crimes to reduce deforestation and forest degradation and other forest crimes. The United States will also engage civil society organizations, including indigenous communities, to develop their capacity to prevent, monitor, and report environmental crimes in support of conservation goals. It will also strengthen community oversight capacity to patrol protected areas and support innovations, including new technologies aimed at reducing threats, with the engagement of the private sector.	Adaptation	Ongoing	2021

Peru	2021, Combatting Environmental Crimes in the Peruvian Amazon, Mitigation, second	1.5	Through this activity, the United States provides specialized technical assistance, training, and other services to strengthen the institutional capacity of key Peruvian institutions and actors, leading to effective prevention, detection and sanctioning of environmental crimes. With an integrated multi-agency approach, this activity will strengthen the Government of Peru's capacity to design and implement policies, laws, and regulations that effectively prevent, detect and sanction environmental crimes to reduce deforestation and forest degradation and other forest crimes. The United States will also engage civil society organizations, including indigenous communities, to develop their capacity to prevent, monitor, and report environmental crimes in support of conservation goals. It will also strengthen community oversight capacity to patrol protected areas and support innovations, including new technologies aimed at reducing threats, with the engagement of the private sector.	Mitigation	Ongoing	2021
Bangladesh	2021, Community Partnerships to Strengthen Sustainable Development (COMPASS), Adaptation	0.5	The activity has several components: promote sustainable land use practices through the development of low emissions development plans and Reducing Emissions from Deforestation and forest Degradation (REDD+) strategies; improve youth employment through a Youth Conservation Corps of Bangladesh; strengthen community capacity and promote public participation and ownership in forestry and Natural Resources Management (NRM) in Bangladesh; increase technical cooperation on forest and ecosystem management; strengthen the capacity of academic and research institutions in NRM and resilience; promote global exchange of natural resource knowledge and skills; and close gender gaps while empowering women and youth in NRM. The activity will establish a Youth Conservation Corps that engages Bangladeshi youth in natural resource management in order to build technical and soft skills while instilling environmental stewardship and creating employment opportunities. COMPASS will support Bangladesh to be self-reliant by increasing the capacity of the government, civil society organizations, and universities to develop, finance, and implement effective natural resource management programs.	Adaptation	Ongoing	2021
Global	2021, Conservation Volunteers, Mitigation	0.32	American Conservation Expert Volunteers, implemented by Conservation Council of Nations through the International Conservation Corps, provides technical assistance to government and community institutions to build protected area management capacity and improve support for conservation among local communities, businesses, legislators, and the visiting public.	Mitigation	Ongoing	2021

Africa Regional	2021, Conserving Critical Congo Basin Forests, Mitigation	2.8	The Conserving Critical Congo Basin Forests (C3BF) program will engage and support political institutions in the Democratic Republic of Congo and other Congo Basin countries to align with the goals of the Paris Agreement, and support coordination of DRC and other regional governments to enable national and regional coordination on land sector climate targets.	Mitigation	Ongoing	2021
Asia Regional	2021, Forest for Water and Prosperity, Mitigation	1	This technical assistance contract will improve management of targeted forest landscapes in three states in India for enhanced ecosystem services and increased inclusive economic opportunities. The United States will work in close collaboration with the GOI's Ministry of Environment, Forests and Climate Change, local governments and communities to adopt innovations and best practices, and build the capacity of local stakeholders to better manage India's forest resources. Targeted landscapes under the program will have the potential to reduce emissions and increase carbon sequestration, increase water flows and conserve biodiversity. Funds will be used to accelerate application of best practices developed under the program. This will include helping Indian state forest departments prepare forest management plans on their own using tools and methodologies developed under the program, scaling up conservation enterprises to provide economic opportunities for forest-dependent people, piloting incentive-based mechanisms for efficient delivery of ecosystem services (particularly water) from forest landscapes. The funds will also be used for institutionalizing monitoring systems within Indian state forest departments for monitoring forest ecosystem services.	Mitigation	Ongoing	2021
Global	2021, Forest Investment Development Facility (ForInvest), Mitigation	5.3	The Forest Data Partnership is a partnership between the U.S. government, the World Resources Institute, Unilever, Google, and the United Nations Food and Agriculture Organization that will address a key barrier to private investment in forests and restoration - the lack of reliable and accessible data on forests and lands. These funds will be combined with existing programs and further enhance the Forest Data Partnership’s efforts to: align with key industry and government stakeholders to identify key data gaps and needs and build consensus and alignment around those; innovate to create the conditions to accelerate geospatial machine learning to develop novel datasets for public use and harmonize workflows to inform present and future initiatives; deploy that data in actionable, innovative, and effective ways through pre-identified and mostly pre-existing pathways; and assess, monitor, quantify and communicate lessons learned on effective pathways and interventions. This approach will establish the enabling conditions to achieve full	Mitigation	Ongoing	2021

			traceability, transparency and accountability in key commodity supply chains and restoration initiatives in a cost-effective manner.			
Brazil, Colombia, Ecuador, Peru	2021, Forest Management and Fire Regional Program., Mitigation	0.2	Forest management and fire prevention are ongoing challenges across the Amazon region, as most countries lack institutional capacity to promote fire management, prevention, and suppression. Limited capacities are exacerbated by weak governance and coordination, putting the Amazon forest sector at a heightened risk for fires and biodiversity loss. In response, the United States will provide specialized expertise to advance national government priorities related to sustainable forest management and conservation throughout the Amazon. With a focus on holistic forest management, this activity will promote fire prevention and suppression, as well as fire management collaboration across the region. This targeted support combines a comprehensive regional approach with country-specific strategies to address key drivers of forest loss and biodiversity degradation throughout the Amazon.	Mitigation	Ongoing	2021
Vietnam	2021, FUV Growth and Sustainability, Mitigation	0.05	The FUV Growth and Sustainability program will support Fulbright University Vietnam (FUV) to be a model and pioneer for Vietnam Higher Education institutions that deliver innovative undergraduate and graduate degree programs using modern teaching practices and integrated curriculum aligned to regional and international education standards. The program supports institutional growth and sustainability, scaling-up the undergraduate programs, and strengthening its research capacity, including support for integration of climate change in education programs and research, such as climate change risks and opportunities, and climate finance.	Mitigation	Ongoing	2021
Cambodia, Indonesia, Philippines, Thailand, Vietnam	2021, Green Invest Asia, Mitigation	1.562	Green Invest Asia is a sustainable-investment platform that aims to catalyze private finance into climate smart agriculture and sustainable forestry businesses to improve regional management of natural capital, promote sustainable economic growth, and reduce carbon emissions. The activity will connect the business sector with the financial sector to build relationships, share knowledge, and develop strategies that promote green investment. Technical services will be offered to both businesses and investors to increase investment and access to markets and finance, introduce incentives, and support a wide range of businesses that reduce emissions from improved land use practices and greening supply chains. The activity will work to catalyze $400 million of private investment for sustainable agriculture and forest landscapes across Asia by 2022, aiming to reduce	Mitigation	Ongoing	2021

			CO2 equivalent greenhouse gas emissions by 25 million tons by 2030. The activity will connect enterprises to regional institutions that invest across companies, commodities, and countries.			
Cambodia, Indonesia, Philippines, Thailand, Vietnam	2021, Green Invest Asia, Mitigation, first	1.876	Green Invest Asia is a sustainable-investment platform that aims to catalyze private finance into climate smart agriculture and sustainable forestry businesses to improve regional management of natural capital, promote sustainable economic growth, and reduce carbon emissions. The activity will connect the business sector with the financial sector to build relationships, share knowledge, and develop strategies that promote green investment. Technical services will be offered to both businesses and investors to increase investment and access to markets and finance, introduce incentives, and support a wide range of businesses that reduce emissions from improved land use practices and greening supply chains. The activity will work to catalyze $400 million of private investment for sustainable agriculture and forest landscapes across Asia by 2022, aiming to reduce CO2 equivalent greenhouse gas emissions by 25 million tons by 2030. The activity will connect enterprises to regional institutions that invest across companies, commodities, and countries.	Mitigation	Ongoing	2021
Africa Regional	2021, Improving Collaborative Conservation and Management of Transboundary Natural Resources in East Africa, Adaptation	0.05	The activity will strengthen EAC's leadership and learning to effectively implement its mandate on conservation and management of transboundary natural resources in the region. EAC is the regional intergovernmental organization which drives the vision for regional integration amongst six countries; Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda. It has the authority to successfully harmonize regional policies and implement strategic approaches and regulation on conservation of transboundary natural resources in the region. The activity will fund: (i) Strengthen EAC Secretariat, Lake Victoria Basin Commission (LVBC) and EAC member states' technical capacity to coordinate regional harmonization of policies, strategies and legal frameworks (ii) Enhance the use of scientific evidence in decision-making processes through regional technical working groups; (iii) Coordinate and convene regional multi-sectoral policy and learning platforms on conservation and sustainable development; (iv) Support EAC's technical capacity building in economic valuation of natural resources in East Africa; and	Adaptation	Ongoing	2021

			(v) Improve regional and bilateral collaboration and information sharing on the reduction of wildlife poaching and trafficking, law enforcement and prosecution of wildlife crimes.			
Africa Regional	2021, Improving Collaborative Conservation and Management of Transboundary Natural Resources in East Africa, Mitigation	0.1	The activity will strengthen EAC's leadership and learning to effectively implement its mandate on conservation and management of transboundary natural resources in the region. EAC is the regional intergovernmental organization which drives the vision for regional integration amongst six countries; Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda. It has the authority to successfully harmonize regional policies and implement strategic approaches and regulation on conservation of transboundary natural resources in the region. The activity will fund: (i) Strengthen EAC Secretariat, Lake Victoria Basin Commission (LVBC) and EAC member states' technical capacity to coordinate regional harmonization of policies, strategies and legal frameworks (ii) Enhance the use of scientific evidence in decision-making processes through regional technical working groups; (iii) Coordinate and convene regional multi-sectoral policy and learning platforms on conservation and sustainable development; (iv) Support EAC's technical capacity building in economic valuation of natural resources in East Africa; and (v) Improve regional and bilateral collaboration and information sharing on the reduction of wildlife poaching and trafficking, law enforcement and prosecution of wildlife crimes.	Mitigation	Ongoing	2021
Philippines	2021, Investing in Sustainability and Partnerships for Inclusive Growth and Regenerative Ecosystems (INSPIRE), Mitigation	0.9	INSPIRE partners with local stakeholders in priority landscape and seascapes, including Indigenous Peoples and vulnerable communities, to implement emissions reduction programs. These include management planning for high conservation value areas, assessment of drivers of deforestation and forest degradation, forest carbon emissions accounting, promotion of conservation agriculture, restorative actions, and training in designing projects that implement natural climate solutions.	Mitigation	Ongoing	2021
Africa Regional	2021, Luangwa Livelihood and Conservation, Mitigation	0.83	This activity aims to promote biodiversity conservation and cross-cutting outcomes in health, water and sanitation, nutrition, and food security that supports resilient ecosystems and communities. The activity provides both training and technical support to strengthen farmers to adopt more productive climate resilient agricultural technologies to increase productivity, reduce labor and	Mitigation	Ongoing	2021

			water needs, and create empowered, climate- resilient farmers. Private-sector partnerships will also provide agronomic extension and facilitate linkages to output markets.			
Malawi	2021, Modern Cooking for Healthy Forests in Malawi - Tiphike Mwa Makono, Adaptation	0.627	The Modern Cooking for Healthy Forests (MCHF) activity promotes: (1) sustainable forest management in select landscapes and (2) alternative options for cooking and heating energy in targeted urban areas to maintain forest cover and increase carbon storage. Funds will be used to: (1) design social marketing and behavior change communications tools with private-sector actors to build demand for commercially viable improved cookstoves and sustainable charcoal; (2) design and solicit the first round of results-based grants to restore and conserve carbon-dense forests in selected landscapes; (3) conduct landscape mapping, baseline forest inventories, and deforestation estimates to develop landscape restoration and forest management plans and agreements; (4) develop new and/or enhance existing forestry regulations and guidelines particularly on legal charcoal production; (5) raise awareness of forestry-related legislation and regulations to prosecutorial staff, the judiciary, and communities to improve law enforcement; and, (6) build the capacity of district forestry offices to set baselines and monitor forest cover and land restoration. By 2024, United States' investments will have supported Malawi to sequester an estimated 942,796 tonnes of carbon dioxide equivalent and reduced deforestation and degradation in approximately 217,000 hectares of forested land.	Adaptation	Ongoing	2021
Malawi	2021, Modern Cooking for Healthy Forests in Malawi - Tiphike Mwa Makono, Mitigation - Climate Specific	1.85	The Modern Cooking for Healthy Forests (MCHF) activity promotes: (1) sustainable forest management in select landscapes and (2) alternative options for cooking and heating energy in targeted urban areas to maintain forest cover and increase carbon storage. Funds will be used to: (1) design social marketing and behavior change communications tools with private-sector actors to build demand for commercially viable improved cookstoves and sustainable charcoal; (2) design and solicit the first round of results-based grants to restore and conserve carbon-dense forests in selected landscapes; (3) conduct landscape mapping, baseline forest inventories, and deforestation estimates to develop landscape restoration and forest management plans and agreements; (4) develop new and/or enhance existing forestry regulations and guidelines particularly on legal charcoal production; (5) raise awareness of forestry-related legislation and regulations to prosecutorial staff, the judiciary, and communities to improve law enforcement; and, (6) build the capacity of district forestry offices to set baselines and monitor forest cover and land restoration. By 2024, the United States' investments will have supported Malawi to sequester an estimated 942,796	Mitigation	Ongoing	2021

			tonnes of carbon dioxide equivalent and reduced deforestation and degradation in approximately 217,000 hectares of forested land.			
Colombia	2021, Nature Tourism, Mitigation	0.164	The Nature Tourism activity aims to harness markets in support of Colombia's transition to an economically sustainable peace, while building social cohesion and contributing to the reduction of deforestation and the protection of biodiversity. The new Nature Tourism activity will strengthen local communities' capacities, especially of women and youth to: 1) plan tourism activities based on sustainable land use, in harmony with environmental protection of natural parks and forest reserves; 2) provide high-quality experiences and services that respond to changing local and international demands; and 3) connect national and international tourism value chains. In addition, the Nature Tourism activity may address other barriers to the sector including poor infrastructure, insufficient private investment, and unclear property rights.	Mitigation	Ongoing	2021
Global	2021, Paris Agreement Transparency Accelerator, Mitigation	1.5	This project will support a key set of countries to build or enhance the reporting systems necessary to generate robust National Inventory Reports and Biennial Transparency Reports, collect key data, perform greenhouse gas emissions estimations and projections, and track progress on climate targets. This project builds upon previous efforts to accelerate international transparency on these areas in line with reporting standards.	Mitigation	Ongoing	2021
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Natural Resources Management (NRM), Adaptation- Climate Specific	0.354	This activity will provide technical assistance and support to help the Solomon Islands improve natural resource management, particularly forest governance. SCALE-NRM will address unsustainable forestry practices in the Solomon Islands by improving data analysis to inform forest and land management decisions, and support participatory land use planning and livelihood opportunities for forest-dependent communities. The activity will provide targeted technical assistance to national level ministries to promote environmental and social standards. It will also support strong community engagement, constituency building, and economic livelihoods related to non-timber forest products. These interventions will lead to improved management of forest resources and curtail the rapid degradation of this important resource.	Adaptation	Ongoing	2021
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) -	1.315	This activity will provide technical assistance and support to help the Solomon Islands improve natural resource management, particularly forest governance. SCALE-NRM will address unsustainable forestry practices in the Solomon Islands by improving data analysis to inform forest	Adaptation	Ongoing	2021

	Natural Resources Management (NRM), Adaptation, firsr- Climate Specific		and land management decisions, and support participatory land use planning and livelihood opportunities for forest-dependent communities. The activity will provide targeted technical assistance to national level ministries to promote environmental and social standards. It will also support strong community engagement, constituency building, and economic livelihoods related to non-timber forest products. These interventions will lead to improved management of forest resources and curtail the rapid degradation of this important resource.			
Solomon Islands	2021, Strengthening Competitiveness, Agriculture, Livelihoods, and Environment (SCALE) - Natural Resources Management (NRM), Mitigation- Climate Specific	1.5	This activity will provide technical assistance and support to help the Solomon Islands improve natural resource management, particularly forest governance. SCALE-NRM will address unsustainable forestry practices in the Solomon Islands by improving data analysis to inform forest and land management decisions, and support participatory land use planning and livelihood opportunities for forest-dependent communities. The activity will provide targeted technical assistance to national level ministries to promote environmental and social standards. It will also support strong community engagement, constituency building, and economic livelihoods related to non-timber forest products. These interventions will lead to improved management of forest resources and curtail the rapid degradation of this important resource.	Mitigation	Ongoing	2021
Africa Regional	2021, Transaction Advisory Support to the Government of Malawi on the Mpatamanga Hydroelectric Power Station, Mitigation	0.267	Provides critical transaction advisory support to the Government of Malawi on the Mpatamanga hydropower plant, to be constructed on the Shire River to provide 350 MW of electricity to Malawi.	Mitigation	Ongoing	2021
Dominican Republic	2021, Energy Storage Regulatory Roadmap Technical Assistance for battery energy storage systems (BESS) in the Dominican Republic, Mitigation	0.62	This grant funds the Energy Storage Regulatory Roadmap Technical Assistance to support the development of regulations to enable the deployment of battery energy storage systems (BESS) in the Dominican Republic. The grantee is the Dominican Republic's electricity regulator, the Superintendencia de Electricidad (SIE). The technical assistance would support SIE in addressing the gaps within the regulatory framework for BESS, including grid connection, performance, and economic remuneration. The grant is anticipated to help mobilize $30 million in financing.	Mitigation	Ongoing	2021
Tajikistan	2022, Comprehensive Action for Climate Change	0.375	The CACCI activity provides technical assistance and works directly with the national institutions including the Committee of Environmental Protection and Ministry of Finance to establish Tajikistan's main body to track its	Mitigation	Ongoing	2022

	Initiative Activity (CACCI), Mitigation, first		commitments under the UN Climate Change agreements, the NDC Secretariat. Strengthening the government's capacity for technological, institutional, and policy innovations is critical to meet these emerging needs at the country level. The United States strengthens the evidence generation, project development, coordination, resource mobilization, and monitoring and tracking capacity of the NDC Secretariat. The United States facilitates a consultative process for development of multi-sectoral collaboration and coordination in establishing procedures, policies, and plans required to deliver NDC goals in line with the national and sectoral development objectives, with an associated policy and framework for monitoring progress.			
Tajikistan	2022, Comprehensive Action for Climate Change Initiative Activity (CACCI), Mitigation, second	0.125	The CACCI activity provides technical assistance and works directly with the national institutions including the Committee of Environmental Protection and Ministry of Finance to establish Tajikistan's main body to track its commitments under the UN Climate Change agreements, the NDC Secretariat. Strengthening the government's capacity for technological, institutional, and policy innovations is critical to meet these emerging needs at the country level. The United States strengthens the evidence generation, project development, coordination, resource mobilization, and monitoring and tracking capacity of the NDC Secretariat. The United States facilitates a consultative process for development of multi-sectoral collaboration and coordination in establishing procedures, policies, and plans required to deliver NDC goals in line with the national and sectoral development objectives, with an associated policy and framework for monitoring progress.	Mitigation	Ongoing	2022
Africa Regional	2022, Comprehensive Action for Climate Change Initiative (CACCI) - Agriculture, Adaptation, first- Climate Specific	0.5	The Comprehensive Action for Climate Change Initiative (CACCI) supports partner African countries and regional intergovernmental organizations and institutions in the implementation of resilience and food security investments under the Nationally Determined Contributions and National Adaptation Plans (NDC/NAPs) as agreed upon in the Paris Agreement on Climate Change. This partnership with the African Union and its Member States, the Regional Network of Agricultural Policy Research Institutes (RENAPRI), regional economic communities (RECs), and other regional bodies supports the development of transformational policies and programs and build human and institutional capacity to mainstream climate policy into strategies at the regional, national, and sub-national level for low-emissions land use, among other sustainable development goals.	Adaptation	Ongoing	2022
Africa Regional	2022, Comprehensive Action for Climate Change Initiative (CACCI) - Agriculture, Adaptation, second- Climate Specific	0.4	The Comprehensive Action for Climate Change Initiative (CACCI) supports partner African countries and regional intergovernmental organizations and institutions in the implementation of resilience and food security investments under the Nationally Determined Contributions and National Adaptation Plans (NDC/NAPs) as agreed upon in the Paris Agreement on Climate Change. This partnership with the African Union and its Member States, the Regional Network of Agricultural Policy Research Institutes (RENAPRI), regional economic communities (RECs), and other regional	Adaptation	Ongoing	2022

			bodies supports the development of transformational policies and programs and build human and institutional capacity to mainstream climate policy into strategies at the regional, national, and sub-national level for low-emissions land use, among other sustainable development goals.			
Africa Regional	2022, Comprehensive Action for Climate Change Initiative (CACCI), Mitigation	0.2	The Comprehensive Action for Climate Change Initiative (CACCI) supports partner African countries and regional intergovernmental organizations and institutions in the implementation of resilience and food security investments under the Nationally Determined Contributions and National Adaptation Plans (NDC/NAPs) as agreed upon in the Paris Agreement on Climate Change. This partnership with the African Union and its Member States, the Regional Network of Agricultural Policy Research Institutes (RENAPRI), regional economic communities (RECs), and other regional bodies supports the development of transformational policies and programs and build human and institutional capacity to mainstream climate policy into strategies at the regional, national, and sub-national level for low-emissions land use, among other sustainable development goals.	Mitigation	Ongoing	2022
Global	2022, Global Climate Action Partnership (GCAP), Mitigation, Cross-Cutting	2.5	The United States helped launch the Low Emissions Development Strategies Global Partnership (LEDS GP) in 2011, which has since grown to include over 150 members with active regional coalitions in Africa, Asia, and Latin America and the Caribbean. In 2021, members of the global steering committee decided to rebrand the LEDS GP as the Global Climate Action Partnership (GCAP). Funding for GCAP will support countries to accelerate action and implementation of pathways toward decarbonization with a greater emphasis on enabling policies and regulatory frameworks, early mover technical projects and pioneering actions, investment mobilization, and governance structures.	Mitigation	Ongoing	2022
Global	2022, Global Climate Action Partnership (GCAP), Mitigation, Energy	2.5	The United States helped launch the Low Emissions Development Strategies Global Partnership (LEDS GP) in 2011, which has since grown to include over 150 members with active regional coalitions in Africa, Asia, and Latin America and the Caribbean. In 2021, members of the global steering committee decided to rebrand the LEDS GP as the Global Climate Action Partnership (GCAP). Funding for GCAP will support countries to accelerate action and implementation of pathways toward decarbonization with a greater emphasis on enabling policies and regulatory frameworks, early mover technical projects and pioneering actions, investment mobilization, and governance structures.	Mitigation	Ongoing	2022
Global	2022, Transparency Accelerator, Mitigation	3	This project will support a key set of countries to build or enhance the reporting systems necessary to generate robust National Inventory Reports and Biennial Transparency Reports, collect key data, perform greenhouse gas emissions estimations and projections, and track progress on climate targets. This project builds upon previous efforts to accelerate international transparency on these areas in line with U.S. reporting standards.	Mitigation	Ongoing	2022
Colombia	2021, Comprehensive Action for Climate Change	0.5	Through the Comprehensive Action for Climate Change Initiative (CACCI), USAID supports the Government of Colombia (GoC) to update its current Nationally Determined Contribution (NDC). CACCI supports the GoC in	Adaptation	Ongoing	2021

	(CACCI) - Adaptation Buy-in, Adaptation		reaching their current NDC committments by building capacity and collaboration within several sectors of the government and private sector to reduce greenhouse gas emissions in their operations and improve planning for climate change adaptation. Furthermore, the activity will help the GoC to monitor NDC implementation progress.			