The Second Biennial Transparency Report of the Republic of Azerbaijan to the UN Framework Convention on Climate Change

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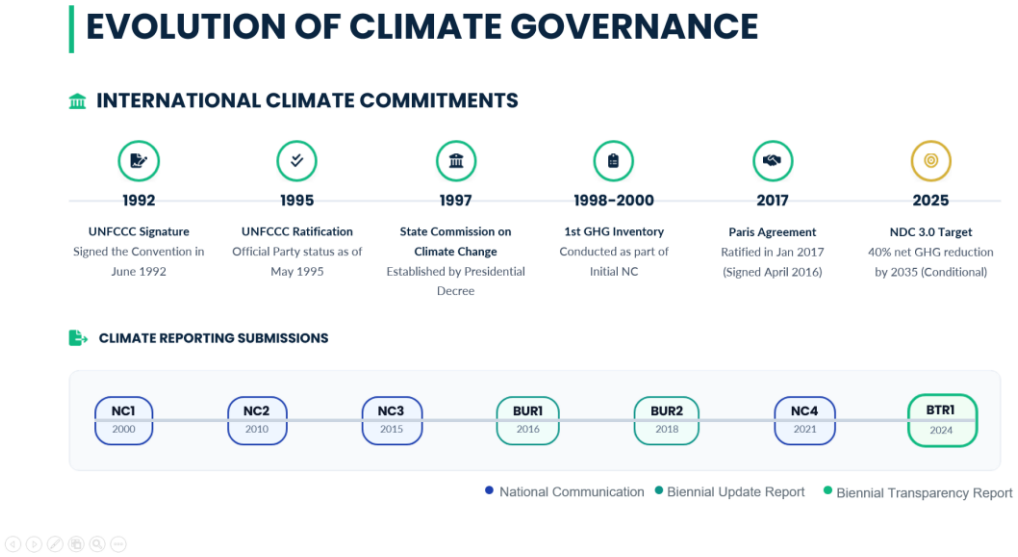
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Introduction

Our modern world faces severe environmental and socio-economic challenges brought about by climate change. This global crisis calls for stronger solidarity, firm political will, and urgent practical action centered around the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. Remaining steadfastly committed to the global climate agenda, the Republic of Azerbaijan pursues a national policy aimed at promoting a sustainable and climate-resilient development model.



Presidency of the 29th session of the Conference of the Parties (COP29) in Baku reconfirmed the country's position as a reliable and unifying leader in international climate diplomacy. Within the framework of COP29, Azerbaijan made significant contributions to reaching new global agreements on climate finance, promoting the operationalization of the Enhanced Transparency Framework (ETF) of the Paris Agreement, and reinforcing trust among Parties. As COP29 coincided with the first-ever submission of Biennial Transparency Reports (BTRs) under the Paris Agreement, the Presidency placed a strong emphasis on climate transparency, making it a central theme alongside the negotiation tracks.

Recognizing both central role of transparency in tracking mitigation, adaptation and means of implementation as well as the challenges faced by many countries in their BTR preparations COP29 Presidency launched the Baku Global Transparency Platform (BTP) aimed at supporting countries in achieving full implementation of the Enhanced Transparency Framework (ETF) under the Paris Agreement. Azerbaijan **o**rganized numerous online and in-person workshops under the Baku Global Transparency Platform (BTP**)** across Central Asia, Africa, Latin America**,** and **i**n Baku, in cooperation with international partners, to support developing countries in the preparation of their BTRs. Moreover, the country convened a High-Level Forum on Transparency on the sidelines of the 79th session of the UN General Assembly to facilitate preparation of the BTRs, strengthen cooperation among partner countries, donor organizations, and other stakeholders, and enhance engagement under the ET, elevated transparency to the highest political level, organizing a High-Level Ministerial Event on Global Climate Transparency at COP29. The event recognized

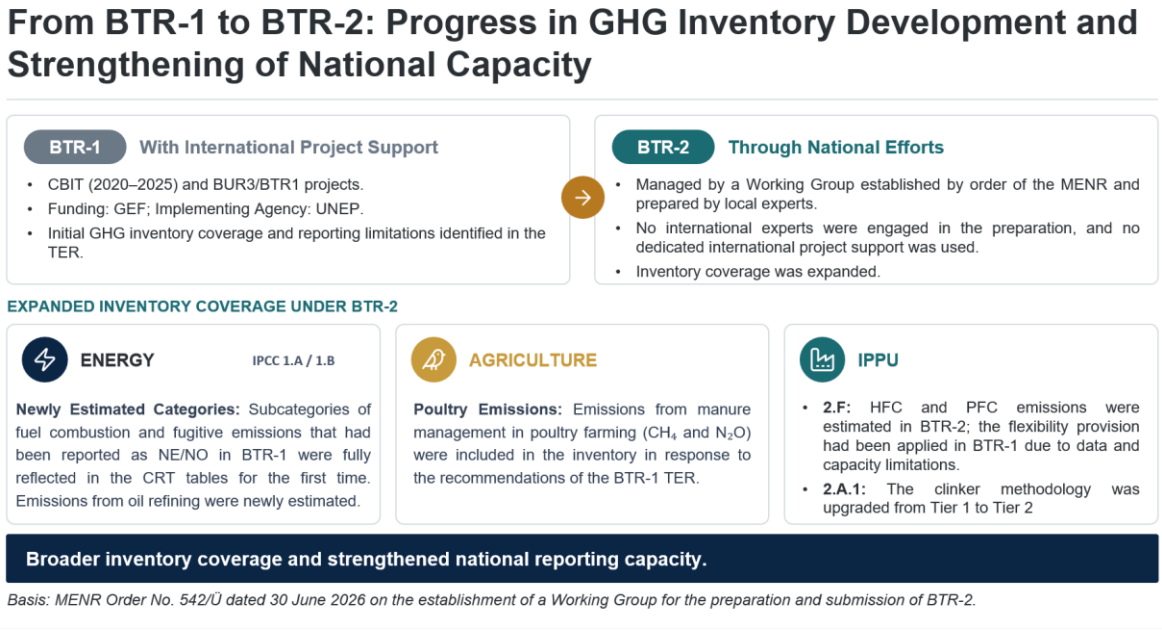
early BTR submissions, commended developing countries' efforts, and amplified their voices in the global transparency process. As an outcome, the Baku Declaration on Global Climate Transparency was adopted, reaffirming transparency as the foundation of effective climate action and underscoring the need for continued support to developing countries. COP 29 and COP30 Presidencies in partnership with UNFCCC organized Ministerial high-level dialogue on Transparency at COP30 to provide a platform for policy makers to discuss priorities under the ETF, recognize the efforts of Parties that have submitted their 1st BTRs, and undergone TER and FMCP (facilitative, Multilateral Consideration of Progress) and to generate strong momentum for the continuous implementation of and universal participation in the ETF. During second UNFCCC CAW in Baku COP29, COP30 and incoming COP31 Presidencies, organized a high-level policy-oriented dialogue and technical workshop to enhance political momentum for the implementation of the ETF and provide targeted technical support to developing countries to advance the preparation of their BTRs

As a logical continuation of the global momentum generated by COP29 Presidency, the annual organization of Baku Climate Action Weeks has evolved into a vital action platform ensuring the continuity of regional and global climate dialogue, as well as public-private partnerships. Furthermore, country's hosting of the 13th UN World Urban Forum (WUF13) (2026) reflects Azerbaijan's contribution to international cooperation on sustainable urbanization and climate-resilient cities. Through large-scale initiatives implemented within the framework of World Environment Day (WED) celebrated in Azerbaijan in 2026, environmental awareness, biodiversity restoration, and the "Zero Waste" concept are actively promoted as integral components of national climate action.

Azerbaijan's share in the global carbon footprint was approximately 0.133% in 2024. Nevertheless, the country attaches special importance to contributing to global climate action and international efforts. The strategic vision is rooted in a long-term sustainable development pathway that integrates environmental protection, green economy development, and renewable energy priorities. Azerbaijan's Long-Term Strategy for Low-Emission Development (LTS) and Nationally Determined Contributions 3.0 (NDC 3.0) are among the key strategic documents that define the country's long-term decarbonization policy. Within this framework, Azerbaijan aims to reduce greenhouse gas emissions by 40 percent by 2035 compared to the base year (1990) and achieve Net-Zero emissions by 2060. The "Green Energy Zone" concepts implemented in the Karabakh and East Zangazur economic regions, as well as in Nakhchivan, stand as vivid examples of this transformation.

The presented Second Biennial Transparency Report (BTR2) is a testament to the value Azerbaijan attaches to transparency and international accountability in global climate action. This document enables the evaluation of progress achieved toward the climate targets and the measures being implemented. I express my sincere gratitude to all partners who contributed to the realization of this report and remain confident that this document will further strengthen green cooperation.

As a Party to the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement, the Republic of Azerbaijan recognizes transparency in global climate action as a top priority of its national climate policy. In accordance with the requirements of the Enhanced Transparency Framework (ETF) established under Article 13 of the Paris Agreement and the modalities, procedures, and guidelines adopted by Decision 18/CMA.1 of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), the country submitted its First Biennial Transparency Report (BTR1) during COP29 held in Baku. BTR-1 contributed to improvements in the national greenhouse gas inventory system, strengthened inventory practices, and enhanced reporting mechanisms for tracking progress towards national climate commitments.



The preparation of the Second Biennial Transparency Report (BTR2), an integral part of fulfilling the reporting obligations of the Republic of Azerbaijan under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, is a complex process requiring close collaboration among government entities, relevant organizations, academic and scientific institutions, experts, and other stakeholders. The report serves to present Azerbaijan's climate actions, achieved progress, and upcoming priorities in a systematic, well-substantiated, and transparent manner.

In the process of preparing BTR2, the collection, analysis, and systematization of data were of paramount importance across key areas, including the inventory and assessment of Greenhouse Gas (GHG) emissions, climate change mitigation and adaptation, tracking progress on the implementation of Nationally Determined Contributions (NDCs), as well as finance, technology transfer, and capacity-building. The quality, consistency, comparability, and transparency of data across these activities played a vital role in ensuring the credibility and reliability of the report.

During the preparation of the report, coordinating data across various sectors, ensuring institutional cooperation, and applying appropriate methodological approaches were key priorities. By applying the methodological guidelines of the Intergovernmental Panel on Climate Change (IPCC) and the reporting requirements of the UNFCCC in greenhouse gas (GHG) inventory calculations, the results became more consistent with international standards, data quality improved, and the national reporting system was further strengthened.

Institutional coordination and intersectoral cooperation are of crucial importance in the preparation of BTR2. Building upon the institutional cooperation experience established during Azerbaijan's previous reporting period under the coordination of the Ministry of Ecology and Natural Resources, the participation of the Ministries of Economy, Energy, Digital Development and Transport, Agriculture and Finance, as well as the State Statistics Committee, SOCAR, "Azerenerji" OJSC, "Azerishig" OJSC, "Tamiz Shahar" OJSC, the Azerbaijan State Water Resources Agency (ADSEA), the Azerbaijan National Academy of Sciences (ANAS) and other relevant entities. This institutional practice demonstrates the significance of intersectoral information exchange and coordinated action in national climate reporting. It is essential to finalize and appropriately reflect the definitive list of entities that contributed to the preparation of BTR2 for the current reporting period.

We express our deep gratitude to all government entities, relevant organizations, academic and scientific institutions, specialists, and experts who contributed to the preparation of this report through the provision of data, sectoral analyses, technical and methodological support, as well as the sharing of expert knowledge. Their professional dedication and collaboration significantly enriched the content of the report, ensured a well-grounded presentation of information, and contributed meaningfully to the development of national transparency mechanisms.

Executive Summary

Chapter I National Inventory Report.

Azerbaijan’s national greenhouse gas inventory for BTR2 has been prepared in accordance with Article 13 of the Paris Agreement and the Modalities, Procedures and Guidelines (MPGs) for the Enhanced Transparency Framework (ETF), contained in the annex to Decision 18/CMA.1. The inventory applies the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and 100-year global warming potential values from the IPCC Fifth Assessment Report (AR5). It covers 1990 as the reference year and the annual reporting years 2020–2024, including emissions and removals of CO_2, CH_4, N_2O and fluorinated gases across the Energy, Industrial Processes and Product Use (IPPU), Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), and Waste sectors.

National GHG Emissions Trends

TOTAL EMISSIONS EXCLUDING LULUCF

75.998 Mt CO_2-eq.

TOTAL NET EMISSIONS INCLUDING LULUCF

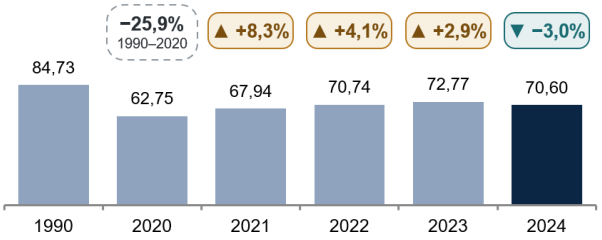
70.601 Mt CO_2-eq.

In 2024, total emissions decreased by 2.98% compared with 2023, while emissions from the Energy sector decreased by 4.1%.

Total emissions increased by approximately 16% during 2020–2023, before declining in 2024. The Energy sector accounted for the largest share of the reduction recorded in the latest year.

Annual percentage changes are calculated relative to the preceding reporting year. The change for 1990–2020 represents the change over the period, rather than an annual change.

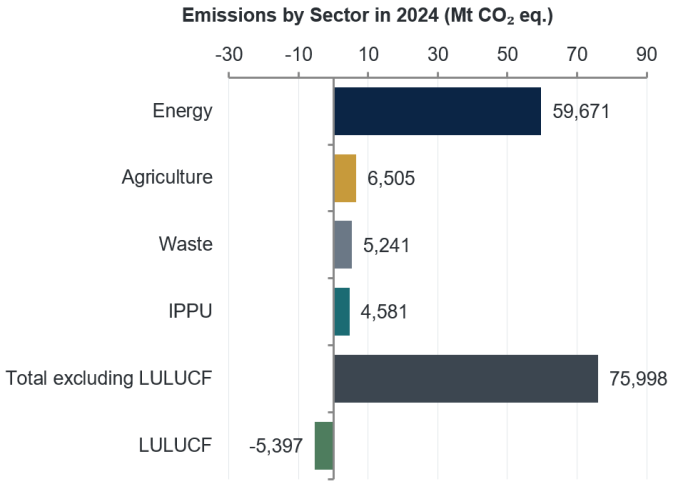
Year	Total emissions, million ton CO_2-eq.	Change compared with 1990 (%)
1990	84,73	0
2020	62,75	−25,94%
2021	67,94	−19,82%
2022	70,74	−16,51%
2023	72,77	−14,11%
2024	**70,60**	**−16,67%**



In 2024, Azerbaijan’s total greenhouse gas emissions excluding LULUCF amounted to approximately 75.998 Mt CO_2-eq, while net emissions including LULUCF stood at 70.601 Mt CO_2-eq. The LULUCF sector provided net removals of approximately 5.397 Mt CO_2-eq, demonstrating the contribution of land-based carbon sinks to the country's overall climate mitigation efforts. Compared with 1990, emissions excluding LULUCF were approximately 14.35% lower, while net emissions including LULUCF decreased by 16.67%. Furthermore, net emissions declined by 2.171 Mt CO_2-eq, or 2.98%, in 2024 compared with 2023, reflecting progress in reducing the country's overall GHG emissions.

A notable development in 2024 was the reduction in emissions from Energy Industries (1.A.1), which decreased by approximately 2.836 Mt CO_2-eq (16.63%), particularly in electricity generation and combined heat and power production. This development coincided with a substantial expansion in electricity generation from renewable sources, including hydropower, wind and solar, which increased from approximately 1.90 billion kWh in 2023 to 3.62 billion kWh in 2024. This increase highlights the growing contribution of renewable energy to Azerbaijan's electricity mix and its potential role in supporting the country's long-term decarbonization objectives. Emissions from Other Sectors (1.A.4) also decreased by approximately 0.999 Mt CO_2-eq (8.13%), while Manufacturing Industries and Construction (1.A.2) recorded a reduction of around 4.22%.

Emissions by Sector in 2024 (Mt CO_2 eq.)



Sector	2024, Mt CO_2-eq	Share of total emissions excluding LULUCF (%)
Energy	**59.671**	**78.5%**
IPPU	4.581	6%
Agriculture	6.505	8.6%
Waste	5.241	6.9%
TOTAL (excluding LULUCF)	**75.998**	**100%**
LULUCF	−5.397	Removals
TOTAL (including LULUCF)	**70.601**	-

Energy remained the largest sector in Azerbaijan's national GHG inventory, accounting for approximately 78.5% of total emissions excluding LULUCF in 2024. The inventory provides detailed information on emissions from fuel combustion and fugitive emissions associated with oil and natural gas activities, supporting improved transparency and the identification of opportunities for further mitigation. In particular, emissions from the oil system decreased by 1.4%, including reductions in venting and flaring. The inventory also provides a more comprehensive assessment of the contribution of individual greenhouse gases, with CO_2 accounting for approximately 60.5% of total emissions excluding LULUCF, CH_4 for 36.4%, N_2O for 2.0%, HFCs for 0.8% and PFCs for 0.3%.

Progress was also recorded across several categories outside the Energy sector. In IPPU, the inventory incorporates updated production data and refined estimation approaches for key industrial processes, including cement and aluminium production, strengthening the assessment of industrial GHG emissions. In Agriculture, reductions were recorded in emissions from enteric fermentation and direct and indirect N_2O emissions from managed soils. The Waste sector inventory was further developed through improved activity data and estimation approaches for municipal solid waste disposal. Meanwhile, LULUCF continued to function as a net carbon sink, offsetting approximately 7.1% of total national emissions excluding LULUCF in 2024 and contributing to the country's overall emissions reduction.

BTR2 represents a significant step forward in strengthening Azerbaijan's national GHG inventory system and its capacity to meet the enhanced transparency requirements of the Paris Agreement. Building on the experience gained through BTR1 and the findings of its technical expert review, Azerbaijan has improved the verification and reconciliation of Energy-sector activity data, particularly for oil and natural gas systems; expanded activity data for fluorinated gases; refined estimation approaches across IPPU, Agriculture and Waste; and applied or further developed higher-tier methodologies in selected categories, including cement production and solid waste disposal. Sector-specific quality assurance and quality control (QA/QC), documentation and data-management procedures have also been strengthened, contributing to improvements in the transparency, accuracy, completeness, consistency and comparability of the national inventory.

The preparation of BTR2 also demonstrates the growing institutional and technical capacity of Azerbaijan in climate reporting. Unlike the First BTR, which benefited from support from the Global Environment Facility (GEF), the Second BTR was prepared solely through the technical and institutional resources of the Ministry of Ecology and Natural Resources of the Republic of

Azerbaijan (MENR), without dedicated international technical or financial assistance or GEF enabling-activity support. This represents an important achievement in strengthening national ownership, institutional capacity and the sustainability of the country's GHG inventory preparation process.

Institutional arrangements for climate reporting are also being progressively strengthened. MENR coordinates national climate reporting in cooperation with the State Statistical Committee and relevant sectoral data providers. The ongoing development of the Climate Law is expected to further reinforce the legal and procedural framework for regular data provision, measurement, reporting and verification (MRV), and national GHG inventory preparation. Together, these methodological, technical and institutional developments provide a stronger evidence base for monitoring national emissions trends, assessing mitigation progress and tracking the implementation of Azerbaijan's commitments under the Paris Agreement, as further elaborated in Chapter II on NDC tracking.

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

The II chapter reflects the relevant information on Azerbaijan’s green transition, decarbonization activities towards inclusive sustainable development. At the beginning the chapter provides the geographical, population, economic profiles as well as governmental structure of the country. It describes market-oriented economic reforms, strengthened macroeconomic stability and diversified its economy after regaining independence in 1991. The outstanding stage of the country’s socio-economic development started after signing “Contract of the Century” in 1994, that has hugely contributed to the overall and robust economic development, distinguish role of the Azerbaijan as oil-gas supplier to EU and other countries, particularly creation of the regional energy TAP-TANAP projects, underpinning the energy security and robust revenue, enabling overall inclusive development of the country.

Actually, the short-term decarbonization agenda of the country is directly linked to the “Azerbaijan 2030: National Priorities for Socio-Economic Development”, signed on February 2, 2021, where clean environment and green growth are among the main priorities of the country. In this regard, “2022–2026 Socio-Economic Development Strategy”, dated 22.07.2022, calls for renewable-energy expansion, energy efficiency, cleaner transport, stronger waste management, forest protection and climate-resilient development. The environmental targets of the strategy include raising green areas from 12% to 12.3%, inventorying 65% of the State Forest Fund, and increasing the share of renewable energy in installed electricity capacity to 24% by 2026, consistent with the 30% target for 2030.

These documents promote a competitive economy, inclusive social development, innovation and human capital, the reintegration of liberated territories, and a clean environment and green growth.

Moreover, the chapter brings some detailed information on negative effects of climate change that presents significant environmental and socio-economic challenges. Thus, over the past 23 years, Azerbaijan’s average temperature has increased by approximately 1.1°C. Rising temperatures, declining precipitation and increased evaporation have intensified water scarcity, heatwaves, land degradation, desertification and wildfire risks. The country’s water resources have decreased by approximately 15% in recent decades, while the Caspian Sea has experienced a substantial decline in water levels, threatening coastal ecosystems, infrastructure and economic activities. In this regard, Azerbaijan has progressively strengthened its climate policy framework under the United Nations Framework Convention on Climate Change and the Paris Agreement. Its updated Nationally Determined Contribution (NDC3.0), submitted in 2025, establishes a conditional target of reducing greenhouse gas emissions by 40% by 2035 compared with 1990 levels. A draft Long-Term Low-Carbon Development Strategy, approved on 22.10.2026, sets a long-term objective of achieving net-zero emissions by 2060. Climate governance is also being strengthened through the

development of a national climate transparency system, greenhouse gas inventories, monitoring, reporting and verification arrangements, and draft climate legislation. Therefore, Azerbaijan's policy framework increasingly integrates climate mitigation, adaptation and environmental sustainability into socio-economic planning. Key priorities include accelerating the green energy transition, improving water and waste management, strengthening climate resilience and transparency, expanding natural carbon sinks, and ensuring that economic diversification and territorial reconstruction advance in line with the country's green growth objectives.

Azerbaijan has prepared and submitted its National Adaptation Plan to the UNFCCC Secretariat and developed a preliminary implementation plan. Hydrometeorological monitoring and early-warning capacities have been upgraded, environmental protection measures include forest restoration, afforestation, expansion of green spaces and modernization of waste management. The Digital Ecology Information System, approved in January 2025, supports improved monitoring and oversight of waste flows, while initiatives promote recycling, reuse and circular-economy principles. Renewable energy development, energy efficiency and environmentally friendly technologies are also important priorities, supported by Azerbaijan's substantial wind and solar potential. The restoration and climate-resilient development of the liberated territories form an integral part of the national sustainable development agenda. Initiatives focus on green energy, forest restoration, modern environmental infrastructure and improved hydrometeorological monitoring, alongside the return of residents and economic reintegration.

Moreover, chapter describes institutional framework of climate change, where the State Commission on Climate Change and Atmospheric Air Protection and Atmospheric Air Protection, chaired by the Deputy Prime Minister, established in 1997 and renewed in 2021, coordinates national climate agenda of the country, implementation of the concrete policies and measures within obligations under the UNFCCC, Paris Agreement and all other decision adopted during COPs. The Ministry of Ecology and Natural Resources facilitates coordination of activities of the Commission. The chapter describes a cross-agency working group and an evolving climate-reporting system. As regards trend of the national emissions profile, the base year level for total economy-wide emissions, according to the latest National GHG Inventory submitted with BTR2 is 84,729 kt CO2 eq. (net emissions). The target level for 2030 is 55,072 kt CO2 eq. that equals 35% reduction from base year. As or the most recent reporting year (2024), the total net emissions are 70,601 CO2 eq., which represents a 16.67% decrease from the base year level.

Actually, the energy sector still remains the largest emissions source in the country, where emissions fell 27.78%, from 80,158 kt CO_2 eq. in 1990 to 59,671 kt CO_2 eq. in 2024. The mentioned decrease is linked to post-soviet industrial contraction and structural change, investment in natural-gas infrastructure, as well as to the shift from mazut and other oil products to the natural gas in the power stations. Since the early 2000s, however, economic recovery, population growth and demand for electricity, transport and household energy have pushed emissions upward. The chapter explains that emissions fell sharply after 1991 and reached a low point in 1998, about 45% below the earlier level, as economic disruption and the closure of energy-intensive industry reduced output. Emissions then increased due to economic recovery and export-led growth, where population increased from 7.1 million in 1990 to about 10.225 million in 2025, increasing demand for energy, housing, food, goods and transport. Moreover, Industrial Processes and Product Use (IPPU) emissions increased 267.53% from 1990 to 2024, driven by cement, construction materials, petrochemicals and industrial recovery, agricultural emissions rose 42.5% by 2024, mainly from livestock and manure management, although livestock emissions declined during 2020–2024. Moreover. By Law № 257-VIIQ of September 14, 2025, the Republic of Azerbaijan ratified the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer.

Waste emissions have increased by 89.93% from 1990 to 2024 as urbanization increased pressure on solid-waste disposal and wastewater systems. On 14.05.2025, President Ilham Aliyev signed a decree "On additional measures in the field of improving waste management", establishing the State Agency for Waste Management under the Ministry of Ecology and Natural Resources that will be responsible for exercising the state control, regulation and coordination in the field of waste

management (formation, collection, sorting, transportation, placement, processing, use, disposal of waste) and collection of fees for waste institution.

Land Use, Land-Use Change and Forestry (LULUCF) sector remains a net sink: reported carbon sequestration increased 34.92%, but land conversion, pasture degradation and overgrazing weaken that contribution. Transport emissions from road, rail and aviation were above 1990 levels, while waterborne transport emissions declined.

Regarding NDC targets and progress tracking, Azerbaijan's original NDC set an economy-wide target to reduce greenhouse gas emissions 35% by 2030 relative to 1990 (base year). NDC2.0 added a conditional 40% reduction by 2050 compared the base year. The NDC3.0, submitted in 2025, sets a more ambitious but conditional target, i.e. 40% reduction by 2035 compared the base year. It also describes a net-zero ambition for 2060 that depends on international finance, technology and cooperation. The BTR2 lists a 2030 target level of 54,990.229 kt CO_2 eq. against the recalculated 1990 baseline of 84,600.35 kt CO_2 eq. The target covers CO_2, CH_4 and N_2O across energy (including transport), IPPU, agriculture, waste and LULUCF.

Progress tracking aligns the NDCs and inventory through activity data, accounting methods and assumptions. The report applies TACCC principles, quality control checks by five sectoral focal points and validation by inventory experts. It uses IPCC Fifth Assessment Report global-warming potentials, whereas some LULUCF estimates use Tier1 methods because more detailed land and forest data are not yet available. The relevant Climate Transparency Platform is being piloted to support inventory management, NDC tracking and climate-finance monitoring and reporting.

The essential share of the emission reductions in the energy sector have been realized through essential expansion of the renewable energy and regional power connections in the country in the recent years. Thus, the technical renewable potential is at 135 GW onshore and 157 GW offshore; onshore economic potential is about 27 GW, including 3 GW wind and 23 GW solar. Reported actual installed renewable capacity, including major hydropower, is 1,829.6 MW out of a total 9,732.5 MW (18.8%), whereas the 2030 target is at least 30%. The relevant projects cited in the document include the 230 MW Garadagh solar plant, the 240 MW Khizi–Absheron wind plant, and a 1,000 MW Masdar portfolio comprising the 445 MW Bilasuvar and 315 MW Neftchala solar plants and 240 MW Absheron–Garadagh wind project. There are also 100 MW Gobustan solar project and additional solar and offshore-wind development agreements, including a planned 200 MW offshore pilot within larger proposals. It also cites technical potential of 15 GW for wind, 115 GW for solar and 5 GW for hydropower; economic potential includes approximately 380 MW of bioenergy and 520 MW from mountain rivers. The report says green-energy projects exceeding 2 GW in installed capacity are planned for implementation by 2027, supported by public-private partnerships and competitive procurement.

Moreover, the territories liberated from occupation and Nakhchivan are being developed as green-energy zones. More than 1,500 residential, public and social buildings in liberated areas have solar panels with combined capacity exceeding 5 MW, over 200 solar collectors, 3,000 energy-efficient streetlights and 20 EV chargers are also reported. "Azerenerji" OJSC has restored or installed 38 small hydropower plants totaling 307 MW, which generated up to 550 million kWh of renewable electricity in 2024. Nakhchivan's green-energy concept is intended to expand renewables, modernize the grid and strengthen energy independence. At the same time the cross-border transmission is part of the mitigation policy direction. The 2022 strategic partnership among Azerbaijan, Georgia, Romania and Hungary envisages exporting Caspian basin green electricity to Europe through the Caspian–Black Sea–Europe corridor, whereas a separate 2024 agreement among Azerbaijan, Kazakhstan and Uzbekistan provides a framework for green-energy development and transmission across Central Asia and the Caspian Sea. These initiatives require generation, transmission and system integration to advance together.

Regarding the concrete mitigation measures in the energy sector, they are focusing on leak detection and repair, methane monitoring, reducing flaring and venting, optimizing process and

compressor operations, lowering fuel-gas use, and improving energy efficiency. In this regard, SOCAR's Decarbonization Action Plan for 2022–2050 covers its operations and prioritizes resource efficiency, lower energy intensity and methane reductions in upstream and midstream activities. The report lists operational interventions at production and processing facilities during 2022–2024, including flare reduction, stripping-gas optimization, compressor and turbine-control improvements, and solar panels for pipeline operations.

Broader energy measures include modernizing generation technology, upgrading transmission and distribution networks, reducing losses, improving building insulation and lighting, and supporting energy-management systems. The approach seeks to balance emissions reduction with the energy sector's economic and strategic role. Renewable-energy legislation adopted in 2021 and investor partnerships support the development pipeline.

Mitigation policies and measures in transport subsector combine modal shift, vehicle efficiency, electrification and operating improvements. Policy instruments include tax and customs exemptions for electric vehicles, chargers and electric buses, charging-station information and planned deployment of charging networks. The chapter cites plans for 500 electric buses in 2025 and 1,100 in 2026, a local bus-production facility with expected annual capacity of 500 vehicles, and charging plans for Baku, the regions and Karabakh. Baku sustainable-mobility program aims to develop a "20-minute city" by 2030, strengthen public transport and use digital-twin modeling; 17 km of bicycle lanes are under development. Baku Metro is preparing a decarbonization roadmap with ADB technical assistance, including energy-efficiency, renewable-energy and digital-management options. Moreover, the mitigations measures in the railroad include energy-network modernization, electrification and renewal of rolling stock. ADB-supported activities for Azerbaijan Railways are assessing the carbon footprint, power network, climate risks and investment needs. In the maritime transport of the country, a pilot EcoPilot system on the Azerbaijan ferry is reported to optimize routing and speed, with an estimated 5–7% reduction in fuel use and emissions. Moreover, national aviation operators participate voluntarily in ICAO's CORSIA scheme, annual MRV reporting is in place. There's no offsetting obligation for Azerbaijani operators during the 2021–2023 pilot phase.

Mitigation policies and measures in AFOLU sector aim both to reduce emissions and to increase removals. Measures include methane capture and biogas from manure, composting, improved pasture management, windbreaks, perennial orchards, afforestation and forest restoration. Millions of seedlings are cultivated annually, the report cites 165,200 hectares of afforestation, reforestation and forest-restoration activity over 15 years and a Bonn Challenge commitment to restore 270,000 hectares by 2030—170,000 nationally and 100,000 with expected international support. As of the beginning of 2026, forest-covered land within the State Forest Fund amounted to 1,060,124.94 hectares, representing 12.24 % of the total territory of Azerbaijan. At the same time, the total area of green spaces established outside the State Forest Fund reached 6,062.6 hectares.

Waste sector emissions reduction centers focus on diverting material from landfill, capturing methane, recovering energy, improving treatment and expanding recycling. For instance, at Balakhani Industrial Park, the 120-hectare sanitary landfill has 26 engineered cells, isolation layers covering 2.9 million m², leachate treatment by reverse osmosis and a 2 MW biogas generator. Moreover, more than 14,000 trees have been planted on the site. A medical-waste sterilization station began operating in 2025. The Baku municipal-waste incineration plant has capacity for 500,000 tonnes annually and can generate more than 200 million kWh; the sorting plant separates paper, glass, plastic and metal. The BTR table estimates annual reductions of about 500,000–550,000 tCO_2e for the incineration and sorting infrastructure and reports a 2023 emission-reduction purchase agreement with BB Energy for verification of reductions. The Balakhani Industrial Park supports private recycling businesses; 28 residents are registered and 21 are operating. In the liberated territories, "Tamiz Shahar" is responsible for waste collection and management while regional landfill and transfer-station infrastructure is developed. Construction and procurement are planned in Aghdam, Jabrayil, Fuzuli and Zangilan; a Gala sorting plant with 100,000-tonne annual capacity is in design preparation for 2027–2029. Nakhchivan's 2023–2027 plans include a

centralized landfill, sorting and recycling, with preparatory land-use approvals underway. Digital waste tracking is advancing through the Digital Ecology Information System, the national municipal solid-waste strategy for 2027–2030 is being prepared. “Azercosmos” also describes a planned “5R” waste hierarchy—reduce, reuse, recycle, recover and remove—combined with energy-use tracking and annual monitoring across its facilities.

The chapter also presents the Long-Term Low-Carbon Development Strategy as the link between near-term NDC commitments and long-term development. The strategy was approved by the Cabinet of Ministers on 21.10.26 and sets out main decarbonization activities and levers toward the reported 2035 reduction target and 2060 net-zero ambition. Taken together, the strategic document has a broad policy and project pipeline—renewable generation and regional corridors, methane abatement, clean transport, forest restoration and modern waste infrastructure—while emphasizing that stronger implementation data and quantified monitoring are necessary to demonstrate whether these actions deliver the intended economy-wide reductions.

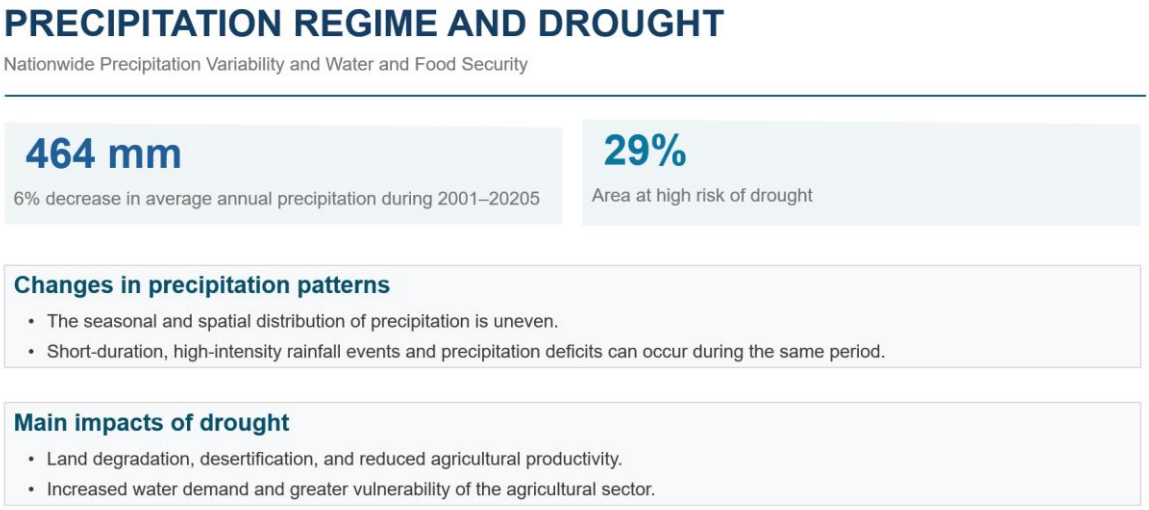
Chapter III. Climate Change Impacts and Adaptation under Article 7 of the Paris Agreement

Azerbaijan’s complex topography, diverse climatic conditions, uneven spatial distribution of water resources and the dependence of key economic activities on climate-sensitive natural systems increase the country’s vulnerability to climate change.

Assessments for 2001–2025 indicate warming across all regions of Azerbaijan. The higher temperature anomalies observed particularly during the last five years point to an acceleration of the warming trend. At the same time, the decline in the number of frost days, increase in hot days and heatwaves, and reduction in snow cover and glaciers in mountainous areas are exerting additional pressure on hydrological regimes and the formation of water resources. Over the past decade, the number of days with mean temperatures above 30°C has increased by up to threefold in some parts of the country, illustrating the growing influence of climate change on extreme temperature conditions.



Analysis of precipitation patterns shows that climate change is affecting not only total precipitation, but also its seasonal and spatial distribution. Over the past 25 years, average annual precipitation across the country amounted to approximately 464 mm, around 29 mm, or 6%, below the 1971–2000 climatological normal. At the same time, increasingly uneven precipitation distribution, periods of rainfall deficit and more frequent short-duration intense precipitation events have been observed. These changes increase the likelihood of drought, flash floods and flooding occurring in different parts of the country within the same period, with implications for water availability, agricultural productivity and infrastructure resilience.



Drought is considered one of Azerbaijan's most significant climate-related risks for water and food security. The 2025 assessment identified 29% of the country's territory as being at high drought risk. Increasing drought intensity can amplify interrelated pressures, including land degradation, desertification, declining agricultural productivity and growing water demand. Strengthened drought monitoring and forecasting, together with more efficient and climate-resilient water-resource management, therefore remain central priorities for adaptation.

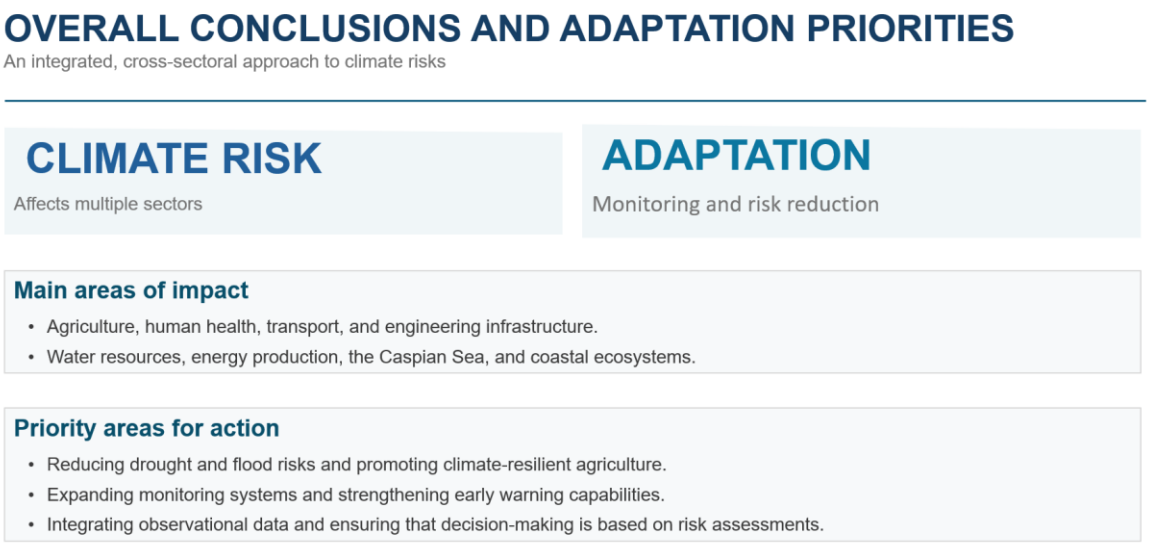
The assessment of hazardous hydrometeorological events also indicates increasing exposure to intense precipitation, floods and flash floods, strong winds, hail and heatwaves. The number of days with wind speeds exceeding 15 m/s has increased by approximately 3.5 times compared with the historical climatological norm. Flood and flash-flood occurrence has also shown considerable interannual variability, including sharp increases in some years. The impacts of such events extend beyond the areas directly affected, creating risks for economic activity, critical infrastructure, public safety and natural ecosystems.



The decline in the level of the Caspian Sea, retreat of mountain glaciers, changes in snow reserves and the increasing risk of forest fires further illustrate the long-term environmental consequences of climate change. The accelerated decline of the Caspian Sea is of particular concern: the average annual rate of sea-level decrease increased from approximately 11 cm during 2005–2020 to 22 cm during 2021–2025. These processes affect water balances and ecosystem stability and increase risks to biodiversity, coastal infrastructure and economic activities dependent on coastal and marine systems.

The assessment further demonstrates that climate risks are increasingly interconnected across sectors. Extreme precipitation, floods and flash floods affect settlements, transport and engineering infrastructure, while heatwaves and rapid changes in weather conditions place additional pressure on human health, agriculture and ecosystems. Declining water availability can simultaneously affect agricultural productivity, energy generation and other economic activities. Adaptation planning should therefore increasingly reflect these cross-sectoral linkages rather than addressing climate risks in isolation.

In recent years, Azerbaijan has taken important steps to strengthen its hydrometeorological and climate-risk information systems, including modernization of the observation network, installation of automated stations, expanded use of remote-sensing technologies, climate-risk mapping and improvements to early warning systems. These measures provide a stronger evidence base for identifying climate hazards, assessing their spatial and temporal distribution and supporting timely decision-making. Further integration of observation data, improvements in climate forecasting and the systematic incorporation of climate-risk assessments into planning and decision-making remain important priorities.



Overall, the assessment confirms that climate change is already a systemic risk affecting multiple sectors in Azerbaijan. Rising temperatures, increasing variability in precipitation patterns, intensifying drought and extreme hydrometeorological events, and ongoing changes in water resources and ecosystems demonstrate the multidimensional nature of the country's climate vulnerability. In light of these trends, key adaptation priorities include reducing drought and flood risks, strengthening sustainable and climate-resilient water management, increasing the resilience of agriculture, protecting ecosystems, expanding hydrometeorological monitoring, and further strengthening multi-hazard early warning systems.

Chapter IV. Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

This chapter presents an account of the financial, technological, and capacity-building support needed and received by the Republic of Azerbaijan during 2023-2024 reporting period, aligned with Articles 9–11 of the Paris Agreement.

In Azerbaijan, the Ministry of Ecology and Natural Resources (MENR) serves as the National Designated Authority (NDA) and climate focal point, coordinating Paris Agreement obligations, NDC implementation, and broader climate policy. Although legal mechanisms exist for monitoring public investment projects, establishing robust inter-agency coordination across line ministries, state-owned enterprises (SOEs), and the financial sector remains essential to ensure ETF-compliant data collection on financial, technological, and capacity-building support. Moreover,

externally funded public technical assistance and grants are legally regulated under Cabinet of Ministers Decision No. 366 (August 22, 2019), which requires executive bodies to submit periodic execution reports to the Ministry of Economy. As the Decision No. 366 does not explicitly categorize climate-specific assistance, MENR and partner institutions have operationalized targeted tracking tools to align national mechanisms with the Paris Agreement's Enhanced Transparency Framework (ETF).

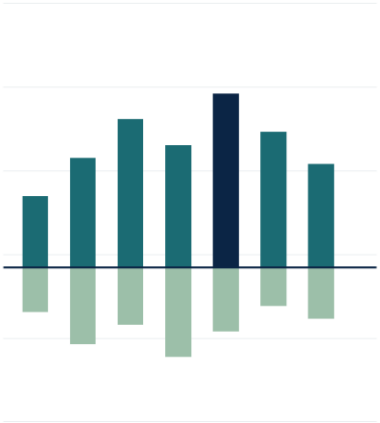
In response to this gap, the MENR has taken steps to improve the reporting of climate-related support needed and received. A Technical Manual was developed to support government institutions in preparing information on the financial, technology, and capacity-building support received and required for inclusion in the BTR. This manual provides guidance on identifying, tracking, and reporting climate-related projects, aligning the reporting process with the transparency requirements under the Paris Agreement's ETF.

To achieve all these ambitious climate targets outlined in national strategies, NDCs, LTS international support is required across several critical areas, encompassing financial support through concessional loans, bank guarantees, and blended finance for capital-intensive clean energy infrastructure, grid modernization, seawater desalination, and sustainable transition; technology development and transfer for commercially viable CCUS deployment, hydrogen electrolysis, battery storage systems, smart grid controls, and modern water-saving irrigation infrastructure; as well as targeted capacity building to strengthen technical capabilities for ETF-compliant MRV systems, Climate Budget Tagging (CBT) refinement, Grant Equivalent calculations, climate risk management, and cross-sectoral assumptions for carbon sink assessments and forestry sequestration modeling.

To bridge the gap between national climate ambitions and implementation, this chapter provides an ETF-compliant assessment of international support received and critical resource gaps across key sectors (renewable energy, industry, agriculture, water, and waste management). It details national institutional frameworks, tracking systems, and methodologies for climate finance, budget tagging, and private capital mobilization. Furthermore, it outlines specific technology transfer needs addressing innovation barriers to deploy low-carbon and resilient solutions and evaluates capacity-building initiatives designed to strengthen technical expertise and mainstream climate action into national policy-making.

CHAPTER I

Report on the National Inventory of Anthropogenic Emissions of Greenhouse Gases by Sources



Chapter I. National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases

ES.1. Background information on GHG inventories and climate change

The Republic of Azerbaijan, as a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, prepares and regularly updates its national greenhouse gas (GHG) inventory in accordance with its reporting obligations under Articles 4 and 12 of the Convention and Article 13 of the Paris Agreement. This National Inventory Document (NID) forms part of Azerbaijan's Second Biennial Transparency Report (BTR2) and presents estimates of anthropogenic GHG emissions by sources and removals by sinks for the period 1990, 2020-2024, in accordance with the modalities, procedures and guidelines (MPGs) established under Decision 18/CMA.1 and further operationalized by Decision 5/CMA.3.

The scientific context for national climate action and transparency reporting has continued to strengthen with the completion of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6). The AR6 Synthesis Report concludes that human activities, principally through greenhouse gas emissions, have unequivocally caused global warming, with global surface temperature reaching approximately 1.1°C above the 1850–1900 level in 2011–2020. AR6 further assesses that continued GHG emissions will lead to increasing global warming and that every additional increment of warming increases climate-related risks, while deep, rapid and sustained reductions in GHG emissions would slow the rate of warming.

AR6 also documents the continued increase in atmospheric concentrations of the principal well-mixed greenhouse gases. In 2019, annual average atmospheric concentrations reached approximately 410 parts per million (ppm) for CO_2, 1,866 parts per billion (ppb) for CH_4 and 332 ppb for N_2O. These findings provide the broader scientific context for the preparation and continuous improvement of national GHG inventories. They do not, however, change the accounting basis applied in this BTR2 inventory: GHG emissions and removals expressed in CO_2

equivalent are calculated using the 100-year global warming potential values from the IPCC Fifth Assessment Report (AR5), in accordance with the applicable ETF reporting requirements.

Azerbaijan's climate engagement spans more than three decades. Azerbaijan signed the UNFCCC in 1992 and became a Party in 1995. In 1997, the State Commission on Climate Change and Atmospheric Air Protection was established by Presidential Decree, providing an institutional foundation for national climate policy and reporting. Azerbaijan's first national GHG inventory was subsequently conducted during 1998–2000. Since then, Azerbaijan has progressively strengthened its climate reporting and transparency system through the preparation and submission of four National Communications, two Biennial Update Reports and, most recently, its First Biennial Transparency Report (BTR1), submitted during COP29 in 2024. Azerbaijan ratified the Paris Agreement in 2017 and submitted its Third Nationally Determined Contribution (NDC 3.0) in 2025.

The national inventory is coordinated through Azerbaijan's national inventory arrangements, with the Ministry of Ecology and Natural Resources having overall responsibility for inventory preparation and reporting, in cooperation with the relevant government institutions and data providers. The current institutional arrangements for national inventory preparation and reporting are described in Section 1.2.

The inventory has been prepared using the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and, where applicable, the 2019 Refinement. Appropriate methodological tiers have been applied according to data availability and category-specific methodological requirements. Detailed information on methods, key categories, uncertainty, completeness, QA/QC and the application of flexibility provisions is provided in the relevant sections of the National Inventory Document. Aggregate GHG emissions and removals are expressed in CO_2 equivalent using 100-year global warming potential (GWP) values from the IPCC AR5. Where applicable, flexibility provisions under the MPGs have been applied in light of identified capacity constraints; the relevant provisions, constraints and improvement timeframes are described in the corresponding sections of this report.

The BTR2 inventory base year is 1990 base. Compared with the previous inventory submission, the BTR2 incorporates improvements in quality control, and recalculations have been undertaken where necessary to maintain consistency of the time series. The submission also reflects progress in addressing improvements identified in BTR1, including the estimation of f-gases, with the current status and remaining improvement needs described in the relevant sections of the report.

The national inventory provides the emissions data required to support the tracking of progress towards Azerbaijan's nationally determined contribution under the Paris Agreement. Under NDC 3.0, Azerbaijan has committed to reducing net greenhouse gas emissions by 40 per cent by 2035 compared with the 1990 base year. The inventory therefore provides an important quantitative basis for assessing progress towards this national climate commitment.

ES.2. Summary of trends related to national emissions and removals

National GHG Emissions Trends

TOTAL EMISSIONS EXCLUDING LULUCF

75.998 Mt CO_2-eq.

TOTAL NET EMISSIONS INCLUDING LULUCF

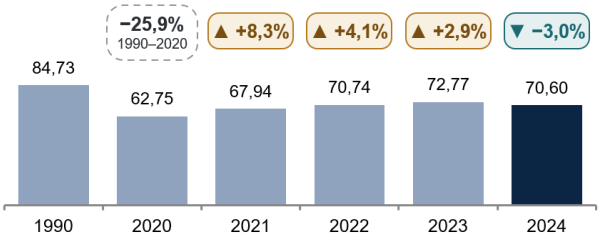
70.601 Mt CO_2-eq.

In 2024, total emissions decreased by 2.98% compared with 2023, while emissions from the Energy sector decreased by 4.1%.

Total emissions increased by approximately 16% during 2020–2023, before declining in 2024. The Energy sector accounted for the largest share of the reduction recorded in the latest year.

Annual percentage changes are calculated relative to the preceding reporting year. The change for 1990–2020 represents the change over the period, rather than an annual change.

Year	Total emissions, million ton CO_2-eq.	Change compared with 1990 (%)
1990	84,73	0
2020	62,75	−25,94%
2021	67,94	−19,82%
2022	70,74	−16,51%
2023	72,77	−14,11%
2024	**70,60**	**−16,67%**



The preparation of national greenhouse gas (GHG) inventories in the Republic of Azerbaijan began in the late 1990s, following the country's ratification of the United Nations Framework Convention on Climate Change (UNFCCC) and in connection with the preparation of its First National Communication. Since then, Azerbaijan has progressively strengthened its national GHG inventory through successive National Communications, Biennial Update Reports and its first Biennial Transparency Report.

For the present report, the national GHG inventory has been updated and recalculated using the latest available activity data and methodological improvements, with a view to maintaining a consistent and transparent time series in accordance with the Enhanced Transparency Framework. The latest inventory results for the base year 1990 and the period 2020–2024 are presented in Table 1.

In 2024, Azerbaijan's total GHG emissions excluding the Land Use, Land-Use Change and Forestry (LULUCF) sector amounted to 75.998 Mt CO_2 eq, which is 14.35% below the 1990 base-year level of 88.728 Mt CO_2 eq. Net national GHG emissions, including emissions and removals from LULUCF, amounted to 70.601 Mt CO_2 eq, representing a 16.67% decrease compared with 84.729 Mt CO_2 eq in 1990. The latest inventory also shows a decline in national emissions in 2024 compared with the preceding year. Total emissions excluding LULUCF decreased by 2.80%, from 78.185 Mt CO_2 eq in 2023 to 75.998 Mt CO_2 eq in 2024, while net emissions including LULUCF decreased by 2.98%, from 72.772 Mt CO_2 eq to 70.601 Mt CO_2 eq.

This national trend occurred against the backdrop of continued growth in global GHG emissions. According to the UNEP Emissions Gap Report 2025, global GHG emissions reached 57.7 Gt CO_2 eq in 2024, increasing by 2.3% compared with 2023. Azerbaijan's net GHG emissions including LULUCF in 2024 were equivalent to approximately 0.1% of this global total, underscoring the country's comparatively small contribution to global GHG emissions.

	1990	2020	2021	2022	2023	2024	1990-2024 difference, %	2023-2024 Difference, %
Energy	80.158	52.558	57.528	60.471	62.198	59.671	−25.56%	−4.06%
IPPU	1.246	3.642	3.902	3.659	4.138	4.581	+267.53%	+10.72%

Agriculture	4.565	7.235	6.942	6.760	6.692	6.505	+42.52%	−2.78%
LULUCF[1]	-4.000	−5.532	−5.387	−5.206	−5.413	−5.397	+34.94% removals	−0.28% removals
Waste	2,760	4.849	4.954	5.058	5.158	5.241	+89.93%	+1.62%
Net emissions	**84.729**	**62.752**	**67.939**	**70.741**	**72.772**	**70.601**	**−16.67%**	**−2.98%**
Total emissions	**88.728**	**68.283**	**73.327**	**75.947**	**78.185**	**75.998**	**−14.35%**	**−2.80%**

Table 1. GHG emissions by sectors, Mt CO_2 eq.

The Energy sector remained the principal source of national GHG emissions, accounting for approximately 78.5% of total emissions excluding LULUCF in 2024. Energy sector emissions amounted to 59.671 Mt CO_2 eq, remaining 25.56% below their 1990 level of 80.158 Mt CO_2 eq. In addition, emissions from the sector decreased by 4.06% compared with 2023, making the Energy sector the main contributor to the overall reduction in national emissions in 2024.

Emissions from Agriculture, the second-largest emitting sector in 2024, amounted to 6.505 Mt CO_2 eq. Although emissions remained above the 1990 level, the recent trend has been downward: Agriculture emissions decreased in each year from 2020 to 2024 and were approximately 10.1% lower in 2024 than in 2020, including a 2.78% decrease compared with 2023.

Emissions from Industrial Processes and Product Use (IPPU) amounted to 4.581 Mt CO_2 eq in 2024. The percentage increase compared with 1990 reflects, inter alia, the comparatively low base-year level and changes in industrial activity and the inventory profile over the period. Despite this increase, IPPU represented approximately 6.0% of total national emissions excluding LULUCF in 2024.

The Waste sector accounted for 5.241 Mt CO_2 eq, or approximately 6.9% of total emissions excluding LULUCF in 2024. Waste emissions increased compared with both 1990 and 2023, although their contribution to the national total remained considerably below that of the Energy sector.

The LULUCF sector continued to provide an important net sink throughout the reported period. Net removals amounted to 5.397 Mt CO_2 eq in 2024, compared with 4.000 Mt CO_2 eq in 1990. Accordingly, the magnitude of net removals in 2024 was approximately 34.94% greater than in the base year, contributing to the lower level of Azerbaijan's net national GHG emissions. Net removals remained broadly stable compared with 2023.

The comparison with 1990 should be interpreted in the context of inventory coverage. Activity data required to estimate removals from Harvested Wood Products (HWP) were not available for the 1990 base year and, consequently, HWP removals were not estimated for that year. HWP removals are included in subsequent inventory years. Part of the difference between reported LULUCF removals in 1990 and later years therefore reflects this difference in category coverage in addition to underlying changes in land-sector emissions and removals.

Carbon dioxide (CO_2) continued to account for the largest share of national GHG emissions. Table 2 presents the trends in CO_2, CH_4 and N_2O emissions excluding LULUCF, expressed in CO_2-equivalent terms.

[1] As data for the 1990 base year is unavailable, removals for the harvested wood products (HWP) category were not calculated.

Gas/ Year	1990	2020	2021	2022	2023	2024	1990-2024 difference, %
CO_2	57.175	42.292	45.072	47.043	49.022	46.000	−19.54%
CH_4	30.405	23.525	25.986	26.783	26.793	27.671	−8.99%
N_2O	1.149	1.809	1.539	1.438	1.678	1.539	+33.99%
HFCs	NE	0.490	0.535	0.549	0.578	0.584	NA
PFCs	0.000083	0.167	0.194	0.134	0.114	0.204	*
Total emissions, excluding LULUCF	**88.728**	**68.283**	**73.327**	**75.947**	**78.185**	**75.998**	**−14.35%**

Table 2. GHG emissions by gases, Mt CO_2 eq.

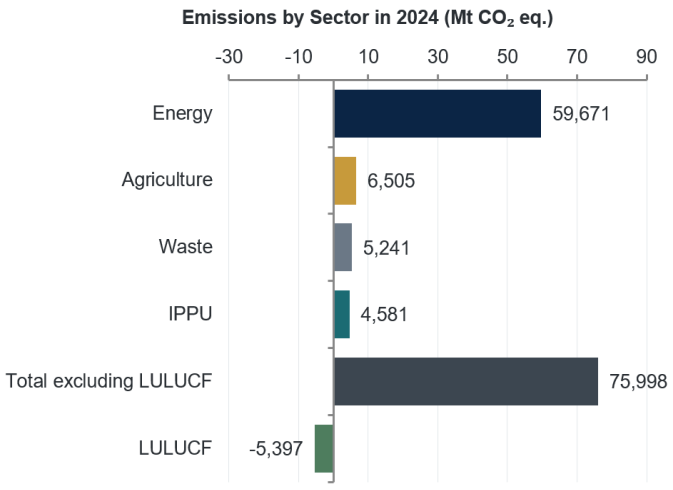
** The percentage change in PFC emissions relative to 1990 is not presented because the base-year emission level was negligible (approximately 0.000083 Mt CO_2 eq), which would result in a disproportionately large percentage change that is not informative for interpretation of the national trend.*

As shown in Table 2, CO_2 remained the principal GHG in Azerbaijan's national emissions profile. CO_2 emissions excluding LULUCF amounted to 46.000 Mt CO_2 eq in 2024, remaining 19.54% below the 1990 level of 57.175 Mt CO_2 eq. CH_4 emissions amounted to 27.671 Mt CO_2 eq, approximately 9.0% below their 1990 level, while N_2O emissions amounted to 1.539 Mt CO_2 eq, approximately 34.0% above the base-year level.

HFC emissions amounted to 0.584 Mt CO_2 eq in 2024 and were mainly associated with relevant IPPU applications, including refrigeration and air-conditioning. A percentage comparison with 1990 is not presented because HFC emissions were reported as NE for the base year. PFC emissions amounted to 0.204 Mt CO_2 eq in 2024 and were primarily associated with aluminium production.

ES.3. Overview of source and sink category emission estimates and trends

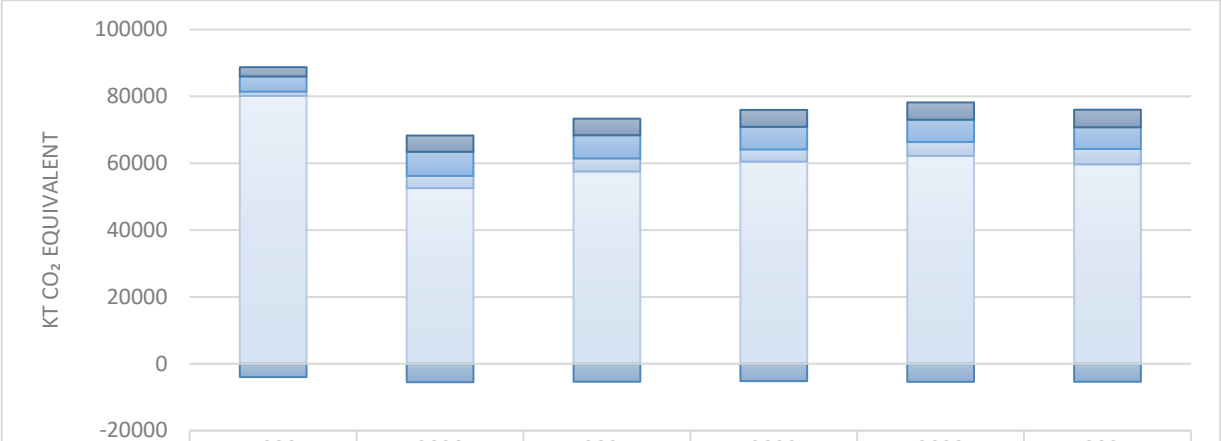
Emissions by Sector in 2024 (Mt CO_2 eq.)



Sector	2024, Mt CO_2-eq	Share of total emissions excluding LULUCF (%)
Energy	**59.671**	**78.5%**
IPPU	4.581	6%
Agriculture	6.505	8.6%
Waste	5.241	6.9%
TOTAL (excluding LULUCF)	**75.998**	**100%**
LULUCF	−5.397	Removals
TOTAL (including LULUCF)	**70.601**	-

Based on the updated national GHG inventory through 2024, Azerbaijan's net GHG emissions, including LULUCF, amounted to 70.601 Mt CO_2 eq in 2024, remaining 16.67% below the 1990

base-year level of 84.729 Mt CO_2 eq. Total emissions excluding LULUCF amounted to 75.998 Mt CO_2 eq in 2024, or 14.35% below the 1990 level of 88.728 Mt CO_2 eq.



	1990	2020	2021	2022	2023	2024
Waste	2760	4849	4954	5058	5158	5241
LULUCF	-3999,89	-5532	-5387	-5206	-5413	-5397
Agriculture	4565	7235	6942	6760	6692	6505
IPPU	1246	3642	3902	3659	4138	4581
Energy	80158	52558	57528	60471	62198	59671

Figure 1. GHG emissions by sectors

As shown in Figure 1, the Energy sector remained the largest source of national GHG emissions in 2024, despite emissions being 25.56% below their 1990 level of 80.158 Mt CO_2 eq. Energy sector emissions amounted to 59.671 Mt CO_2 eq in 2024 and decreased by a further 4.06% compared with 2023, making the sector the principal contributor to the overall year-on-year reduction in national emissions. In 1991–1999, there was a noticeable reduction in GHG emissions. This reduction can be explained by the sudden rupture of the economic ties formed over 70 years between the countries of the former Soviet Union, a paralyzed state of production, and the deepening of the inflationary process, i.e., the economic crisis experienced. During 1991–1994, the Gross Domestic Product (GDP) in the country's economy declined by an average of 16.5% annually. The downward trend was particularly serious in industry: the industrial production volume fell by 10% in 1991, by 37% in 1992, and by 50% in 1993 compared to 1985. Although there were short-term fluctuations in GHG removals in the LULUCF sector during the 1990s, there is a tendency to increase the absorption of carbon from the atmosphere as a result of newly laid forest massifs and the planting of perennial agricultural crops.

The IPPU sector shows a substantial increase relative to the base year, with emissions rising from 1.246 Mt CO_2 eq in 1990 to 4.581 Mt CO_2 eq in 2024, corresponding to an increase of 267.53%. This change should be interpreted in the context of the comparatively low 1990 base-year level, developments in industrial production and changes in the composition and level of emission sources represented in the sector. In addition to process-related emissions from mineral, chemical and metal industries, fluorinated gases have become a more visible component of the IPPU emissions profile in recent inventory years. HFC and PFC emissions together amounted to approximately 0.788 Mt CO_2 eq in 2024. Emissions from the Agriculture sector amounted to 6.505 Mt CO_2 eq in 2024, representing an increase of 42.52% compared with 1990. This long-term increase reflects, among other factors, changes in livestock populations and agricultural activity over the inventory period. However, the recent trend has been downward: Agriculture emissions decreased in each year from 2020 to 2024 and were approximately 10.1% lower in 2024 than in 2020, including a 2.78% decrease compared with 2023.

The LULUCF sector remained a net sink throughout the period presented. Net removals amounted to approximately 5.397 Mt CO_2 eq in 2024, compared with approximately 4.000 Mt CO_2 eq reported for 1990. The magnitude of reported net removals was therefore approximately 34.94% greater

than in the base year and remained broadly stable compared with 2023. The comparison with 1990 should take into account that activity data required to estimate removals from Harvested Wood Products (HWP) were not available for the base year and, consequently, HWP removals were not estimated for 1990.

The Waste sector also shows a long-term increasing trend. Emissions increased from 2.760 Mt CO_2 eq in 1990 to 5.241 Mt CO_2 eq in 2024, representing an increase of 89.93%. The trend reflects changes in waste generation, disposal and wastewater-related activity over the inventory period. The increase in the most recent year was comparatively moderate, at 1.62% compared with 2023.

Overall, the updated inventory demonstrates that the substantial long-term reduction in Energy sector emissions has kept Azerbaijan's national GHG emissions below the 1990 base-year level, notwithstanding increases in several non-Energy sectors.

ES.4. Other information (e.g. indirect GHGs, precursor gases)

Inventories of precursor gases CO, NO_x, NMVOCs (Non-Methane Volatile Organic Compounds), and SO_2 were calculated using the IPCC's revised 1996 methodology only under the First and Second NCs. Subsequent GHG inventory reports did not account for indirect GHG emissions. NMVOCs from the energy sector were calculated in the 4th National Data. Therefore, although Azerbaijan, as a developing country, did not provide information in its First BTR during the current reporting period due to resource shortage and time constraints, the relevant institutions of MENR are taking appropriate measures to ensure the conduction of inventory of the country's precursor gas emissions, a state body responsible for GHG inventory, and will provide relevant information on them in future BTR and NIR reports.

ES.5 Key category analysis

According to the 2006 IPCC guidelines, Parties to the UNFCCC, the Kyoto Protocol and the Paris Agreement are required to calculate and publish their GHG emissions data annually. These GHG emission reports shall be transparent and easy to understand; they shall be calculated consistently over the years since 1990; they shall be compared with the uniform estimates at the international level using established calculation methods; and completeness shall be ensured for all relevant emission sources and commitments in the reporting country. To facilitate the concentration of the numerous and detailed activities and resources required for this purpose into major inventory categories, the IPCC has introduced the term "key category". These methods include annual inventory analysis (Approach 1, Level Assessment), time series consistency analysis of inventory data (Approach 1, Trend Estimate), and data analysis of detailed inventory (Approach 2, Trend Uncertainty).

Key categories are those identified in the national inventory system because their emissions have a significant impact on total greenhouse gas emissions directly, either in terms of absolute emissions or as a contribution to the trend of emissions over time, or both. The key category analysis was conducted for all inventory categories (either with or without the LULUCF sector) according to the level/trend assessment of the 2006 IPCC Guidelines. It covers the key categories for the referred baseline year (1990) and the last reporting year 2024, using Approach 1, either with or without the LULUCF categories. More detailed information on the key categories is provided in the GHG inventory section.

ES.6. Improvements introduced

Improvements in the descriptions and calculation methodologies of the National Inventory Improvement Plan (NIIP) were implemented, taking into account proposals on reducing gaps in previous inventories. In accordance with paragraphs 14 and 15 of Article 13 of the Paris Agreement, financial and technical support was provided to Azerbaijan as a developing country within the framework of the Capacity-building Initiative for Transparency project (CBIT) in Azerbaijan in order to meet the requirements of the transparency mechanism of the Paris Agreement for the implementation of Article 13.

To promote continuous improvement, Azerbaijan, to the extent possible, has identified and regularly updated information on areas for improvement and included them in its reporting as part of the BTR. As a developing country needing flexibility in terms of capabilities, Azerbaijan considers it necessary to continue focusing and promoting areas for improvement in the GHG inventory. Chapter 10 of the report provides detailed information on the areas of improvement implemented and planned within the current GHG Inventory report.

1. National circumstances, institutional arrangements and cross-cutting information

1.1. Background information on GHG inventories and climate change

1.1.1. Background information about climate change

Azerbaijan is a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement and has reported information on its national greenhouse gas emissions and removals through its National Communications and Biennial Update Reports. The present inventory is prepared as part of Azerbaijan's reporting under the Enhanced Transparency Framework (ETF) of the Paris Agreement and represents the continuation of the country's national greenhouse gas inventory reporting and improvement process.

The IPCC Sixth Assessment Report confirms that human activities have unequivocally caused global warming, providing the scientific basis for strengthened national efforts to reduce greenhouse gas emissions and enhance removals. Azerbaijan's national greenhouse gas inventory provides the quantitative basis for reporting anthropogenic emissions by sources and removals by sinks under the Paris Agreement and supports the assessment of progress towards national climate objectives.

The inventory has been prepared in accordance with the Modalities, Procedures and Guidelines for the transparency framework established by Decision 18/CMA.1 and the reporting guidance adopted under Decision 5/CMA.3, applying the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and relevant subsequent refinements and guidance. Aggregate emissions and removals are expressed in CO_2 equivalent using the 100-year global warming potential values from the IPCC Fifth Assessment Report (AR5), in accordance with the MPGs.

1.1.2. Climate change in national context

Azerbaijan is located in the South Caucasus, between the Greater and Lesser Caucasus mountain systems and the Caspian Sea, and covers approximately 86.6 thousand km². Its varied topography and geographical position give rise to diverse climatic conditions, with eight of the eleven climate types occurring within the country.

Azerbaijan's national circumstances, including its geographical setting, land-use characteristics and economic structure, are important for understanding the national greenhouse gas emissions and removals profile. These national circumstances are considered in the preparation and interpretation of the national greenhouse gas inventory, including the identification of key categories, selection of appropriate methodologies and emission factors, assessment of emission trends, and estimation of emissions and removals where relevant.

Detailed information on observed climate trends, climate variability, projected climate change, climate-related hazards, impacts and vulnerabilities in Azerbaijan is provided in Chapter 3, Climate Change Impacts and Adaptation, including the Climate Profile section.

1.1.3. General information on conducting a GHG emissions inventory

The countries of the world are aware that the expected temperature shifts due to the increase of GHG emissions in the Earth's atmosphere will pose a threat to ecosystems and human civilization. Changes will occur relatively rapidly, and existing systems will not be able to adapt to the new climate conditions without experiencing damage. In this regard, Parties to the UNFCCC have agreed to submit annual inventories of greenhouse gases, which are the main cause of current climate change, to the Secretariat of the Convention from April 15 each year, and relevant decisions have been taken in this respect. Such inventories shall include data on emissions and removals for the base year (CO_2, N_2O, CH_4, HFC, PFC, SF_6 and NF_3) and all subsequent years beginning with the reporting year (1990). Developing countries are entitled to report at least 3 greenhouse gas emissions using the flexibility provisions of the MPGs.

The effectiveness and success of the Paris Agreement to reduce global greenhouse gas emissions, like the effectiveness and success of the Kyoto Protocol in this regard, depend on two

main factors: first, whether the Parties will adhere to the rules of the Agreement and fulfill their commitments; and second, whether they will set more serious targets for more ambitious contributions to greenhouse gas emission reductions. In these matters, the reliability of emission data used for compliance control is of utmost importance. Thus, national accountability and subsequent international accountability for GHG emission inventories play a key role in addressing urgent global issues like climate change.

The Republic of Azerbaijan, which joined the UNFCCC in 1995, started the inventory of national GHG emissions in 1998. The inventory was prepared within the framework of the project “Initial National Communication of Azerbaijan”, implemented with financial support from the Global Environment Fund and technical assistance from the UN Development Program. The inventory process was then carried out according to the time series specified in the National Communication submitted by Azerbaijan to the UNFCCC.

In the 4th National Communication presented by Azerbaijan to the UNFCCC, the inventory process covered the years 1990-2016. In this project, the years 1990-2010 were recalculated, and the recalculation covered the years 2011-2016.

In the First Biennial Transparency Report (BTR1), the national GHG inventory was prepared in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The Second Biennial Transparency Report (BTR2), as the most recent national reporting, further updated the inventory, incorporating revised activity data, methodological improvements and recalculations, and extending the inventory time series from 2020 to 2024.

During the inventory preparation, previously reported GHG inventory data presented in the country's National Communications, BURs and BTR1 were reviewed. The updated inventory provides an assessment of changes in national GHG emissions and removals compared with the 1990 base year. During the inventory, there was used information of the SSC, MENR, as well as other relevant ministries, organizations, and companies. The inventory covered all sectors suggested by the IPCC. However, there are still information gaps and other uncertainties regarding certain sector categories.

The Republic of Azerbaijan’s contribution to global warming has historically been relatively small. In 2024, the country’s gross greenhouse gas (GHG) emissions, excluding the Land Use, Land-Use Change and Forestry (LULUCF) sector, amounted to approximately 75,998 kt CO_2 equivalent, while net GHG emissions, including removals from the LULUCF sector, totalled approximately 70,601 kt CO_2 equivalent.

This national trend occurred against the backdrop of continued growth in global GHG emissions. According to the UNEP Emissions Gap Report 2025, global GHG emissions reached 57.7 Gt CO_2 equivalent in 2024, an increase of 2.3% compared with 2023. Azerbaijan’s net GHG emissions, including LULUCF, therefore accounted for approximately 0.1% of the global total, underscoring the country’s comparatively small contribution to global GHG emissions.

In 2024, Azerbaijan’s gross GHG emissions amounted to approximately 7.4 tonnes of CO_2 equivalent per capita, while net emissions, including LULUCF removals, were approximately 6.9 tonnes of CO_2 equivalent per capita.

1.2. A description of national circumstances and institutional arrangements

1.2.1. Geographic and climate profile

This section describes the institutional, procedural and data-management arrangements established by Azerbaijan for the preparation, quality control, approval and submission of its national greenhouse gas inventory under the Enhanced Transparency Framework. General national circumstances and the national climate profile are presented in the relevant sections of this report, while detailed information on climate impacts, vulnerability and adaptation is provided in the adaptation chapter.

1.2.2. National GHG inventory and responsible organizations.

Following Azerbaijan's ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in 1995, an institutional framework was established to fulfil the country's commitments under the Convention, including the assessment of anthropogenic greenhouse gas (GHG) emissions and removals, the preparation of national GHG inventories and the submission of national reports to the UNFCCC Secretariat.

The State Commission on Climate Change and Atmospheric Air Protection, established in 1997, provides inter-agency coordination for national activities related to climate change, including the preparation of GHG inventories and the implementation of related national programmes and measures. The composition of the State Commission on Climate Change and Atmospheric Air Protection was updated by Presidential decision of 11 March 2020. The Commission is chaired by the Deputy Prime Minister, while the Minister of Ecology and Natural Resources serves as Deputy Chair, and MENR serves as the Secretariat of the Commission. The Commission comprises representatives of relevant ministries, state agencies and major state-owned enterprises, including the Ministry of Ecology and Natural Resources, Ministry of Energy, Ministry of Agriculture, State Statistical Committee, State Oil Company of the Republic of Azerbaijan (SOCAR), “Azerenergy” OJSC and other relevant institutions. The Commission coordinates climate-related activities among the represented institutions within their respective mandates and provides an inter-agency mechanism for the implementation of national climate policies and related reporting activities. In addition, the position of Special Representative of the President of the Republic of Azerbaijan on Climate Change was established, further strengthening high-level institutional coordination and representation on climate change-related matters.

The Ministry of Ecology and Natural Resources of the Republic of Azerbaijan (MENR) is the central governmental institution responsible for climate change policy and reporting under the UNFCCC and serves as Azerbaijan's designated national authority under relevant international climate mechanisms.

In accordance with the Modalities, Procedures and Guidelines for the Enhanced Transparency Framework (ETF) adopted under Decision 18/CMA.1, Parties are expected to maintain national institutional arrangements for the preparation and reporting of national GHG inventories. Azerbaijan's institutional arrangements comprise the State Commission on Climate Change and Atmospheric Air Protection for inter-agency coordination and MENR as the lead governmental institution responsible for climate change reporting and inventory coordination.

Within MENR, the Climate and Meteorological Research Centre of the National Hydrometeorology Service is responsible for coordinating the preparation of Azerbaijan's national GHG inventory, including coordination of sectoral data collection, GHG emission and removal estimates, quality control, preparation of inventory-related reporting and related analytical and capacity-building activities.

The inventory preparation process involves relevant state institutions and sectoral data providers, including the State Statistical Committee, the Ministry of Energy, the Ministry of Agriculture, SOCAR and other government institutions, enterprises and organizations, as applicable to the respective inventory categories. While the central coordination function is located within MENR, sectoral institutions generally provide activity data and other information relevant to their respective areas of responsibility rather than maintaining dedicated national-inventory units.

The national institutional arrangements support the preparation and continuous improvement of the GHG inventory in accordance with the principles of transparency, accuracy, completeness, consistency and comparability, including through the application of the 2006 IPCC Guidelines and ongoing quality management and quality control procedures.

The institutional framework is also being further strengthened through the draft Law of the Republic of Azerbaijan "On Climate"[2], published by MENR for public consultation on 22 July 2026. The draft Law envisages the designation of MENR as the National Designated Authority, with responsibility for, among other functions, the preparation and coordination of the national GHG inventory and the fulfilment of related international reporting obligations.

As the Climate Law remains a draft under public consultation at the time of preparation of this report, the provisions described above represent proposed institutional and legal arrangements and are not currently presented as legal requirements in force. The institutional designations contained in the draft are also subject to the outcome of the legislative process and subsequent implementing decisions.

1.2.3. MRV system for national GHG inventory

The principal institutional organizations involved in the national greenhouse gas inventory are the Ministry of Ecology and Natural Resources (MENR) and the State Statistical Committee (SSC), together with relevant sectoral state institutions, state-owned enterprises and other organizations providing activity data.

The SSC provides official statistical information used in the preparation of the national greenhouse gas inventory and collects data from departments, organizations and enterprises operating across the country's economic sectors. Since 2014, a dedicated greenhouse gas inventory section has been incorporated into the annual statistical reporting form No. 2-TP (air), “Report on the Protection of Atmospheric Air”. Enterprises emitting pollutants and greenhouse gases from stationary sources complete the form and submit it through the SSC's electronic reporting system, following the applicable coordination and approval procedures involving MENR's State Environmental Security Service and its Regional Departments of Ecology and Natural Resources. The information collected through and reflected in SSC's annual statistical publications and constitutes an important source of data for the national inventory.

While the SSC provides a substantial volume of activity data relevant to the national inventory, some data may require further disaggregation, clarification or adaptation to meet the methodological and format requirements of the 2006 IPCC Guidelines. Further strengthening of the existing statistical and sectoral data-collection arrangements is therefore necessary to improve the availability, consistency, completeness and usability of activity data for inventory preparation.

MENR's subordinate institutions also provide activity data and other information relevant to specific inventory categories. These include the Forestry Development Service, Biodiversity Conservation Service, State Environmental Security Service, State Agency for Environmental Expertise and Regional Departments of Ecology and Natural Resources, as applicable to their respective areas of responsibility. GHG emissions are calculated by the entity responsible for national inventory compilation within MENR using activity data obtained from these and other relevant institutional sources. The entity responsible for national inventory compilation within MENR also undertakes the assessment and management of uncertainties associated with the inventory.

The national inventory system also involves data obtained from sector-specific government institutions, state-owned companies, enterprises and other organizations responsible for activities covered by the inventory. Data received from different institutional sources are compared and cross-checked by inventory compilers to identify discrepancies and improve the consistency, completeness and reliability of the activity data used for emission estimation. In particular, information collected through the SSC is cross-checked against information compiled by MENR as part of the national inventory process, as well as against annual reports and other relevant information provided by the respective sectoral institutions, organizations and enterprises.

[2] https://www.eco.gov.az/az/nazirlik/xeber?newsID=30641

Identified discrepancies are investigated and addressed, as appropriate, to ensure the consistency and reliability of the activity data used in the inventory.

Azerbaijan has further strengthened its MRV and inventory-management infrastructure through the development of the National Climate Transparency Platform under the national CBIT project. The Platform was officially transferred to MENR in 2025 and provides an integrated digital environment for GHG inventory management, NDC progress tracking and mapping of support for transparency-related activities.

For the GHG inventory function, the Platform provides structured workflows for the submission and review of data by designated institutional focal points. Its chain-based QA/QC workflow enables submitted activity data and calculations to be reviewed by designated verifiers before approval, thereby strengthening traceability, coordination and transparency in the inventory preparation process.

The Platform represents a further development of Azerbaijan's existing institutional MRV arrangements rather than a replacement of the established statistical and sectoral data-collection mechanisms. Training and capacity-building activities on the use of the Platform have also been conducted for relevant line ministries and other stakeholders. Further institutionalization of the Platform is required for its full operationalization, including the establishment of an appropriate legal and procedural basis for its regular and mandatory use by relevant government institutions and other data providers. Such a basis would clarify institutional responsibilities for data submission, review and approval and help ensure continuity and consistency of the national inventory data flow through the Platform.

The Platform is designed to complement and progressively strengthen the existing statistical and sectoral data-collection mechanisms rather than replace them. Further institutionalization is required for its full operationalization, including the establishment of an appropriate legal and procedural basis for its regular and mandatory use by relevant government institutions and other data providers. Such a basis would clarify institutional responsibilities for data submission, review and approval and help ensure continuity and consistency of the national inventory data flow via the National Climate Transparency Platform.

A further strengthening of the legal framework for MRV and national inventory data provision is currently under development. On 22 July 2026, MENR published the draft Law of the Republic of Azerbaijan “On Climate”[3] for public consultation. The draft law contains a dedicated Chapter VII, “Monitoring, Reporting and Verification System and National Inventory”, which sets out proposed provisions concerning MRV at enterprise, sectoral and national levels and specifically addresses national inventory preparation, data provision, QA/QC, archiving and international reporting.

Of particular relevance to the national inventory, Article 29.3 of the draft law would establish an obligation for state bodies, state enterprises and other entities subject to data-provision requirements to provide the information necessary for national inventory preparation in the prescribed format, within the prescribed timeframe, and in a complete and accurate manner. Article 29.4 would authorize the National Competent Authority to determine the format, periodicity, submission method and methodological requirements for information required for national inventory preparation. If adopted, these provisions would provide a stronger legal basis for addressing existing gaps in the consistency, timeliness and standardization of activity-data flows from institutional data providers.

The draft law also envisages the establishment of a climate data sub-system within the state “Digital Ecology” Information System (REİS). Under Article 36, the proposed sub-system would support the electronic exchange and processing of emission data, MRV reports and national

[3] https://www.eco.gov.az/az/nazirlik/xeber?newsID=30641

inventory results, as well as electronic submission, automated verification, archiving and retention of change histories.

If adopted, the proposed provisions would strengthen the legal and institutional basis for the continuity, standardization and traceability of Azerbaijan's national inventory data flows, particularly by establishing clearer obligations for data providers and providing a legal framework for standardized data formats, submission procedures and methodological requirements.

1.2.4. Inventory preparation process

At the beginning of each annual inventory cycle, the composition of the sectoral working groups and relevant sub-sector experts is reviewed and confirmed. Where necessary, new experts are involved or existing experts are replaced. In addition to experts from relevant government agencies, the private sector, scientific institutions, independent experts and relevant NGOs are also involved in the preparation of GHG emission inventory. Experts from relevant government institutions, scientific institutions, the private sector, independent experts and relevant non-governmental organizations participate in the preparation of the GHG inventory, as appropriate.

MENR regularly convenes meetings of the working groups. Furthermore, if needed, the relevant members of the working group meet to discuss specific issues and take any necessary internal measures.

Sectoral working-group meetings are convened as part of the inventory preparation process, with additional meetings held as required to address specific methodological, data or other technical issues.

The inventory preparation process follows a regular annual cycle comprising planning, data collection and validation, compilation and calculation, key-category and uncertainty assessment, quality assurance and quality control, technical review, and improvement planning.

Activity data are collected from the institutional data sources described in Section 1.2.2. Inventory compilers review and cross-check information received from different sources to identify discrepancies, inconsistencies and data gaps. Identified discrepancies are investigated with the relevant data providers and addressed, where possible, before the data are used for emission and removal calculations.

Ministries and other participating organizations address identified information gaps within their respective areas of responsibility. Where continuous provision of required information is not ensured, the relevant institutions are engaged to address the gaps and, where necessary, appropriate discussions and capacity-building activities are conducted.

Sectoral emission and removal estimates are compiled and calculated in accordance with the methodologies, activity data and emission factors applied under the 2006 IPCC Guidelines. The calculation results are reviewed by the responsible sectoral experts and inventory compilers before integration into the national inventory.

GHG emissions/removals were estimated using 2006 IPCC Software (Version 2.98). CRT tables were generated using IPCC software and ETF Reporting Tools. Detailed information on GHG emissions/removals for 1990, 2020-2024 is presented in the National Inventory Report of the Republic of Azerbaijan for 1990-2024 (Part I of the Second Biennial Transparency Report).

Key categories are identified using the methodologies provided in Volume 1, Chapter 4 of the 2006 IPCC Guidelines, including Approach 1 for level and trend assessment. Uncertainty considerations are taken into account in the inventory preparation process in accordance with the approaches and data availability applicable to the national inventory. The systematic application and documentation of uncertainty assessment are being further strengthened as part of the ongoing improvement of the inventory.

General quality control procedures are applied throughout the inventory preparation process. These include checks of activity data, units, calculations, data consistency, transcription and

documentation, as well as cross-checking of information received from different institutional sources. Identified errors and discrepancies are corrected as part of the compilation and review process.

Improvement needs identified during inventory preparation, including data gaps, methodological refinements and areas requiring further disaggregation, are considered in planning subsequent inventory cycles.

Documentation and archiving of inventory calculation files, supporting information and related records are addressed in Section 1.2.5.

1.2.5. Processes for official consideration, approval and submission

Following completion of the national GHG inventory and consideration of comments and recommendations received through the technical review and consultation process, the national inventory team finalizes the National Inventory Report (NIR).

The final NIR is submitted to the Ministry of Ecology and Natural Resources (MENR) for consideration and approval. The NIR, together with the Biennial Transparency Report (BTR), is reviewed by the Ministry, taking into account comments and proposals received from relevant state authorities involved in the preparation of the national GHG inventory and the BTR Working Group. Where necessary, the documents are revised to address the comments received and ensure the accuracy and consistency of the reported information.

Upon completion of this process, MENR approves the NIR and the BTR and officially submits them to the UNFCCC Secretariat, through the National Focal Point to the UNFCCC, in accordance with the international commitments of the Republic of Azerbaijan under the Convention and the Paris Agreement.

1.2.6. Archiving of information

Archiving of inventory-related information supports the transparency, traceability and reproducibility of the national greenhouse gas inventory and facilitates the preparation of subsequent inventory cycles.

In accordance with paragraph 19 of the Annex to Decision 18/CMA.1, Azerbaijan archives information used in the preparation of the national greenhouse gas inventory, including activity data, emission factors, documentation related to the generation and aggregation of data, quality assurance and quality control (QA/QC) records, review results and information on planned inventory improvements.

National Communications, Biennial Transparency Reports, inventory calculations, and interim and final reports are submitted to and stored by the Climate and Meteorological Research Centre of the National Hydrometeorological Service under the Ministry of Ecology and Natural Resources (MENR). Inventory information is archived separately by category and sector to facilitate retrieval and review. Archived material includes information used in inventory preparation, together with relevant methodological documentation and supporting explanations.

At the end of each reporting period, the inventory documentation is archived and stored electronically on a server. Sectoral contributions submitted by responsible experts are validated and archived. Archived information is organized in folders by inventory year and, where applicable, by IPCC sector and source category to facilitate retrieval and review.

The National Climate Transparency Platform is being progressively operationalized to strengthen the digital management and archiving of national GHG inventory information. At present, its Knowledge Base module is used to support the structured electronic storage of inventory-related information and documentation.

These archiving arrangements facilitate access to information required for subsequent inventory cycles and support the identification and implementation of inventory improvements.

1.3. Brief general description of methodologies (including tiers used) and data sources used

1.3.1. General methodological framework

Azerbaijan's national greenhouse gas inventory is prepared under the Enhanced Transparency Framework (ETF) of the Paris Agreement, in accordance with Article 13 of the Paris Agreement and the modalities, procedures and guidelines adopted by Decision 18/CMA.1 and the reporting guidance adopted by Decision 5/CMA.3. Azerbaijan applies the 2006 IPCC Guidelines for National Greenhouse Gas Inventories as the principal methodological basis for estimating anthropogenic greenhouse gas emissions by sources and removals by sinks.

The inventory covers the Energy, Industrial Processes and Product Use (IPPU), Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), and Waste sectors. Aggregate emissions and removals are expressed in CO_2 equivalent using 100-year global warming potential values from the IPCC Fifth Assessment Report, in accordance with the applicable ETF reporting requirements.

Where applicable and where used in the inventory, subsequent IPCC refinements or supplements are identified in the relevant sectoral and category sections.

1.3.2 Methods, tiers and emission factors

The inventory uses the tiered methodological structure of the 2006 IPCC Guidelines. It is predominantly based on Tier 1 methods and IPCC default emission factors, while country-specific parameters and higher-tier methods are applied for individual categories where appropriate and where the necessary national data are available. The methodological tier and emission-factor type applied to individual inventory categories are summarized in Table X.

(Table X has not been updated in the present report due to time constraints associated with its preparation using the Ministry's own technical and institutional resources, without dedicated international technical or financial support, including GEF enabling activities. The updated table summarizing the methodological tiers applied across inventory categories will be provided in the subsequent updated version of the report.)

Key categories are identified using the methodology of the 2006 IPCC Guidelines. The results and methodology of the key category analysis are presented in Section 1.4.

Where the application of higher-tier methods for particular key categories is not currently feasible, the applicable flexibility provisions under the MPGs are applied and areas for methodological improvement are documented in the relevant sections.

1.3.3 Activity data and institutional data sources

Activity data are obtained primarily from official statistical and institutional sources. The State Statistical Committee (SSC) provides core statistical data used in the inventory, including data collected through the annual statistical Form No. 2-TP (air), established through cooperation between the SSC and the environmental authorities. The form supports the collection of information from reporting enterprises, particularly for stationary industrial and energy-related sources.

Additional sector-specific data are provided by the Ministry of Energy, Ministry of Agriculture, Ministry of Digital Development and Transport, SOCAR, Azerenerji OJSC, Azerbaijan Railways CJSC and other relevant institutions. The principal data sources and institutional responsibilities by inventory sector are summarized in Table X.

(Table X due to time constraints associated with the preparation of the report using the Ministry's own technical and institutional resources, without dedicated international technical or financial support, including GEF enabling activities, the table has not been updated for the present version and will be provided in the subsequent updated version of the report.)

1.3.4 Country-specific parameters and NCVs

Azerbaijan uses country-specific net calorific values (NCVs) for relevant fuel streams where such national parameters are available. National NCVs for energy products are derived from national technical and analytical information and are reported in the official statistical publication Energy of Azerbaijan. Updated 2024 data for domestically produced energy products are presented in Table 3.

Energy products	National Lower Heating Value (NCV), GJ/t – NCV (TJ/kt)	Energy products	National Lower Heating Value (NCV), GJ/t – NCV (TJ/kt)
Crude oil	42.726	**Vacuum gas oil**	39.368
Crude oil (including gas condensate)	42.906	**Atmospheric gas oil fraction**	42.935
Gas condensate	43.848	**Light naphtha / Light phlegma**	37.440
Motor gasoline	43.308	**Lubricants (T-46)**	41.867
Motor gasoline (AI-92)	43.300	**Lubricants (T-1500)**	39.757
Motor gasoline (AI-95)	43.400	**Natural gas (dry)**	7,951–8,900 kcal/m³ (≈33.3–37.3 GJ/1,000 m³)*
Diesel fuel	43.205	—	—
Jet fuel	42.964	—	—
Liquefied gases (BBF)	45.419	—	—
Liquefied gases (PPF)	45.891	—	—
Naphtha	42.950	—	—

Table 3. National lower heating values (NCV) of energy products, 2024

Inventory NCVs are distinguished from energy-statistical conversion coefficients, including conversions to tonnes of oil equivalent, tonnes of standard fuel and MWh.

1.3.5 Inventory software and data processing

The inventory calculations are performed using the IPCC Inventory Software, version 2.98, and the resulting inventory information is prepared for reporting through the Common Reporting Tables (CRTs) using the ETF Reporting tool.

1.3.6 Quality assurance, uncertainty, verification and improvements

Quality assurance and quality control procedures applied during inventory preparation are described in Section 1.5. The approach to inventory uncertainty is described in Section 1.6, while verification, recalculations and time-series consistency are addressed in Section 1.10. Methodological improvements and planned improvements are also described in Section 1.10.

1.4. Brief description of key categories

(The key category analysis is currently being reviewed and updated. The updated key category analysis, includin g revised level and trend assessments and supporting tables, will be incorporated into a subsequent updated version of Azerbaijan's BTR2.)

Please see the draft initial version of the Key Categories below:

IPCC code	IPCC category	Gas	1990 estimate	2024 estimate	1990 level rank[1]	rank[1]	rank[2]
1.A.1	Energy Industries – Gaseous Fuels	CO_2	12,558.266	13,440.208	3 / 3	2 / 2	6 / 6
1.A.1	Energy Industries – Liquid Fuels	CO_2	10,414.351	763.886	4 / 4	– / –	2 / 2
1.A.2	Manufacturing Industries and Construction – Gaseous Fuels	CO_2	14,714.525	2,449.612	2 / 2	9 / 10	1 / 1
1.A.3.b	Road Transportation – Liquid Fuels	CO_2	4,820.401	9,724.086	6 / 6	4 / 4	3 / 3
1.A.4	Other Sectors – Gaseous Fuels	CO_2	6,722.631	10,271.573	5 / 5	3 / 3	4 / 4
1.A.4	Other Sectors – Liquid Fuels	CO_2	3,743.852	971.216	7 / 7	– / –	8 / 8
1.B.2.a	Fugitive Emissions from Fuels – Oil	CO_2	1,138.818	3,405.188	– / –	6 / 7	7 / 7
1.B.2.a	Fugitive Emissions from Fuels – Oil	CH_4	3,468.856	3,254.936	8 / 9	7 / 8	– / –
1.B.2.b	Fugitive Emissions	CH_4	20,466.221	13,885.722	1 / 1	1 / 1	5 / 5

	from Fuels – Natural Gas						
2.A.1	Cement Production	CO_2	401.396	2,421.888	– / –	– / –	9 / 9
3.A.1	Enteric Fermentation	CH_4	3,377.037	4,782.603	– / –	5 / 5	10 / 10
3.B.1.a	Forest Land Remaining Forest Land	CO_2	−3,693.185	−3,694.198	– / 8	– / 6	– / –
4.A	Solid Waste Disposal	CH_4	1,005.421	2,636.605	– / –	8 / 9	– / 11
4.D	Wastewater Treatment and Discharge	CH_4	1,616.573	2,422.257	– / –	10 / 11	– / –

[1] Level rank: excluding LULUCF / including LULUCF. The first number is the rank excluding LULUCF; the second is the rank including LULUCF.

[2] Trend rank: excluding LULUCF / including LULUCF, for the period 1990–2024.

A dash (–) means that the category does not fall within the cumulative 85% threshold in that assessment. Negative estimates represent net removals.

Table X. Key categories identified under Approach 1: level and trend assessments, 1990–2024

The table presents the 14 distinct category–gas combinations identified as key in at least one of the six Approach 1 assessments. The ranking is based on the cumulative 85 per cent threshold applied in accordance with paragraph 25 of the MPGs. The identification of a category in one assessment does not necessarily imply that it is also identified in the other assessments. The inclusion of LULUCF affects the relative contributions and, consequently, the rankings of certain categories.

1.5. Brief general description of QA/QC plan and implementation

The 2006 IPCC GHG inventory guidelines state that one of the key issues in the inventory process is the successful implementation of QA/QC. An overview of the quality targets for GHG emissions inventory is provided mainly in the indicators derived from the 2006 IPCC Guidelines (Volume 1, Chapter 6). Furthermore, individual operational objectives for quality assurance and quality control for different categories are set based on the comparison of the requirements of the 2006 IPCC Guidelines, the results of an independent inventory control and the assessments.
In accordance with the 2006 IPCC Guidelines (Volume 1, Chapter 6) and paragraph 19 of the Reporting Guidelines (24/CP.19), the QA/QC measures required for reporting emissions shall be summarized in a QA/QC plan. Such a QA/QC plan shall serve the main purpose of the organization, planning and monitoring of QA/QC measures. To achieve these goals, measures for ensuring transparent and effective control on the implementation and monitoring of actions are referred to specific roles and specific categories in the quality control and quality assurance plan. As part of quality assurance, quality assurance measures shall also be implemented on the work schedule.

In this context, quality controls are not actually defined as controls, but as quality objectives (data quality objectives according to the 2006 IPCC, Volume 1, Chapter 6.5). However, it is necessary to either confirm compliance with the objectives or justify non-compliance. All Parties shall develop a QA/QC inventory plan in accordance with the IPCC Guidelines, including information on the inventor organization responsible for the implementation of QA/QC. Information about this is given in the Improvement section of the report and subsection 1.9 on areas of flexibility.

Starting from 2018, i.e. from the 2nd BUR, Azerbaijan began to prepare the GHG emissions inventory based on the 2006 IPCC methodology. Reports issued before 2018 (1st, 2nd, 3rd NCs and BUR 1) referred to the 1996 IPCC guidelines.

Azerbaijan's checklists have been reviewed annually for updates and revised or expanded as needed. Like the checklists, the QA/QC tasks are constantly being improved. QA/QC checklists are tools for verifying the compliance with international requirements and they allow inventory quality control by initiating quality assurance measures as outlined in Article 13 of the Paris Agreement on National Guidelines.

The majority of data needed for the inventory process was sourced from the data of the SSC. It is worth noting that since 2007 the SSC has established its work on the basis of the standards of the International Energy Agency (IEA). Clarifications and elimination or reduction of uncertainties are addressed through requests submitted by MENR to ministries, agencies, companies and enterprises. Moreover, if information is not obtained from the specified sources, the necessary information will be searched on the relevant websites.

In order to verify the quality of reports prepared on GHG, independent experts who are usually not directly participated in inventory process were involved.

The inventory results for the Energy sector for the years 1990 and 2020-2022 were compared to IEA calculation sources as part of the QA/QC measures implemented. (See: Section 3. Energy).

Some measures are described in the inventory report related to the data collection by the SSC on QA/QC. The inventory report does not contain details on quality control procedures performed at other stages of inventory. The SSC has its own data verification procedures as part of the statistical data generation process.

The provisions of Chapter 6 of Volume 1 of the 2006 IPCC Guidelines will be taken as a base when preparing the QA/QC plan.
To support the GHG inventory process there is required a legal document (law, regulation or other). In Azerbaijan, a QA/QC plan is in the process of preparation, which contains specific measures, duties and responsibilities and timelines. The national procedures for establishing the legal framework, including minimum requirements for quality control and assurance in preparing the GHG Inventory, are currently in progress. After the adoption of the relevant national law on GHG inventory and relevant regulatory rules, an appropriate plan on key elements of the inventory such as QA/QC will be prepared and detailed information will be provided in the next transparency reports. The delay in the preparation of the QA/QC plan is mainly explained by objective reasons such as the lack of human resources for GHG inventory, the lack of national legislation in this field, failure in establishing appropriate institutional structures in the relevant sectors, etc. In cases where necessary information is needed, the decision of the State Commission on Climate Change and Atmospheric Air Protection serves as the legal basis for the GHG inventory.
QC activities include common methods such as data collection and verification of their calculation accuracy, emission/absorption assessment, measurements, uncertainty assessments and using approved standardized procedures for archiving information and reporting.
The prepared legal documents will address the entire inventory process (legal, institutional and procedural). There is limited information on national inventory systems, the duties and responsibilities of various stakeholders and the initial legal framework for the GHG inventory.

As strongly recommended in the efficient inventory experiment conducted, a higher-level QA/QC procedure was applied in the key categories of resources, methodological selection and recalculation operations were performed. These procedures covered the years 1990, 2020-2022, energy, industry, agriculture, LULUCF and waste industry.

In reports prepared using the Tier 1 approach, inventory indicators were compared with the results of emission estimations calculated using the IPCC methodology coefficients and further with reports issued by the IEA.

One of the positive practices for ensuring completeness in the inventory process is to precisely define whether GHG emissions are included in any sector and whether they are not double-counted.

There were also some difficulties in ensuring completeness. Thus, there is lack of data on GHG emissions. For instance, due to the cessation of using ozone-depleting substances and resuming of the use of their alternatives after 2005 and for some other reasons, information on those gases was not provided in the inventory. However, certain information about the F-gas emissions is included in the report.

For the official review and approval of the GHG inventory in Azerbaijan, supplementary measures are taken in addition to the ones executed in the implementation process. After summarizing the final results of the national inventory by MENR as an NCA, it is submitted to the Cabinet of Ministers to be sent to the relevant authorities for providing their feedbacks (opinions) and proposals. This intra-state procedure can be called a kind, but also indirect part of the QA/QC process. After receiving feedbacks and proposals from relevant organizations, the Cabinet of Ministers sends them back to the MENR for their submittal to the UNFCCC.

1.6. General uncertainty assessment

(The general uncertainty assessment is currently being reviewed and updated. The ongoing work aims to strengthen the assessment of uncertainties associated with activity data, emission factors and estimation methodologies across inventory sectors, in accordance with the 2006 IPCC Guidelines. The updated uncertainty assessment will be incorporated into a subsequent updated version of Azerbaijan's BTR2.)

1.7. General assessment of completeness

(The general completeness assessment of the national GHG inventory is currently being reviewed and updated. The updated completeness assessment, including revised information on non-estimated categories, data gaps and supporting justifications, will be incorporated into a subsequent updated version of Azerbaijan's BTR2.)

1.8. Metrics

GHGs vary in their ability to absorb energy (referred to as “radiation efficiency”) and their duration of existence in the atmosphere (known as “lifetime”). In the light of these differences, the Global Warming Potential (GWP) was developed, where the radiation efficiency of one metric ton of GHG is compared to one ton of CO_2 over a specific period of time, usually 100 years. This allows us to estimate the global warming effects of different gases. A higher GWP indicates that a given gas has a more significant warming effect on Earth than CO_2 over a certain period of time.

Thus, GWP is the ratio of the time-integrated radiation force emerging from instantaneous release of 1 kg substance to 1 kg reference gas. The reference gas used is CO_2, so the emissions measured in GWP are expressed in units of CO_2 equivalent.

In Azerbaijan's national GHG inventory, the latest GWPs for the 100-year period, i.e. data from the IPCC Fifth Assessment Report were used.

1.9. Summary of applied flexibilities

In accordance with paragraph 2 of Article 13 of the Paris Agreement, in the implementation of the provisions of Article 13 in the ETF, flexibility is provided to developing country Parties that need it in the light of their capacities, and, if necessary, the Parties shall ensure it and reflect such flexibility in their reports.

According to Article 13(2) of the PA, MPGs provide flexibility capacities for developing countries that need it.

In terms of the application of the flexibility provided for in the provisions of MPGs, developing Parties that need it shall determine their position. The developing country shall clearly indicate the

provision to which the flexibility applies, briefly clarify the capacity constraints, noting that some constraints may be related to several provisions and submit estimated timeframes for improvements to address these constraints. When a developing country Party applies the flexibility provided for in the MPGs, the technical expert review teams will not consider the Party's decision to use such flexibility or whether the Party is able to implement that particular provision without flexibility.

Azerbaijan has developed a summary of data on the specific flexibility provisions applied, indicating the capacity constraints associated with the application of flexibility in the provisions and time frames defined for improvements related to these constraints (**Table 9**).

Areas covered by provisions where flexibility is applied in the report	**Capacity constraints related to the application of flexibility**	**Improvements envisaged for the country by areas**	**Information on the implementation of improvements**
1. Sequence of time series and recalculations Azerbaijan, as a developing country, presents the GHG inventory of only 1990 as a base or reference year and the last 3 reporting years (2020-2022) as part of the BTR report using the opportunities created by clauses 57 and 58 of the MPG on GHG inventory.	This provision, allowing for the application of flexibility, is explained by the lack of information on the use of the 2006 IPCC methodology guidelines in certain sectors, resource, especially time constraints and language barriers of local experts (particularly in agriculture) related to the use of existing methodologies.	Currently, domestic procedures are underway to improve the legislation on GHG inventory in the country. The process is expected to be completed in 2025, with the adoption of the relevant legal normative documents. In this regard, a series of trainings on the 2006 IPCC Guidelines are planned with the participation of all relevant institutions.	In the next BTR reports, in accordance with 2006 IPCC and UNFCCC Guidelines, an inventory will be conducted for the years after 1990, which is already the base year and the country will include this information in its 2nd BTR document. Meantime, in order to overcome the language barrier, it is planned to translate the relevant country-specific sections of the 2006 IPCC Guidelines into the Azerbaijani language.
2. Development of a quality assurance/quality control plan. In accordance with paragraphs 34 and 35 of the MPG, each Party shall prepare a QA/QC plan for the inventory in accordance with the 2006 IPCC Guidelines provided for in paragraph 20 of the MPG, including information on the inventory organization responsible for performing the QA/QC. Taking into account the time constraints in the light of its capacities with respect to this provision, Azerbaijan takes advantage of the opportunity to apply flexibility as a developing country.	The national legislation on GHG inventory, along with related normative acts, is still under development and not yet ready. At the same time, the lack of experts familiar with the IPCC (2006) methodology in the relevant state institutions and the private sector, the language barriers of national experts in studying the 2006 IPCC methodology, etc.	The “Inventory of heat trapping gases and development of Measurement, Reporting and Verification (MRV) system”, as well as the implementation of the corresponding paragraphs in the Action Plan of the State Commission on Climate Change and Atmospheric Air Protection are envisaged in the 1st paragraph of the action direction 5.2.5 of the document “Socio-economic development strategy of the Republic of Azerbaijan for 2022-2026”.	The QA/QC plan is expected to be ready and implemented by approximately 2026. In the country's 2nd Transparency Report, a more advanced GHG emissions inventory report will be prepared on the implementation of this plan.

	can be noted. In particular, lack of resources and time constraints have affected the country's application of flexibility in this area.		
3. Information about the conducted GHG inventory **According to Article 48 of the MPG, Azerbaijan applies flexibilities considering its needs as a developing country and it provides information, covering 3 main gases and 2 additional gases (5 in total) in its 1st BTR report.**	Insufficient statistical data required for GHG emissions inventory, inconsistencies between statistical data collection rules and requirements of the 2006 IPCC Guidelines, lack of resources in relevant sectors and time constraints are the primary obstacles.	Currently, domestic procedures are underway to update legislation on the GHG inventory. The process is scheduled to be completed by 2025, with the adoption of appropriate legal normative documents. Meantime, the adaptation of national statistical data to the 2006 IPCC Guidelines is one of the planned major improvements.	The State Commission on Climate Change and Atmospheric Air Protection has developed an Action Plan for the implementation of these improvements. These improvements are expected to be finalized in 2026 and put into practice in the next NIR and BTR reports.
4. Uncertainty assessments According to paragraph 29 of the MPG, each Party shall quantitatively estimate and qualitatively discuss the uncertainty for all source and sink categories of the cadastre for at least the starting year and the last reporting year of the time series, as specified in paragraphs 57 and 58. Azerbaijan, as a developing country that needs flexibility in the light of its capacity with respect to this provision, has instead applied flexibility to provide a qualitative discussion of uncertainty for key categories, using the IPCC Guidelines referred to in paragraph 20. The determination of the key categories at a level not lower than 85% is mainly explained by the lack of resources and time constraints.	The main constraints in implementing flexibility on uncertainties were capacity constraints, lack of resources and time constraints.	The key categories of GHG emissions in Azerbaijan - combustion of fuel in the energy sector, fugitive emissions, cement and F-gas production in the IPPU, livestock, forestry and other areas in the AFOLU, residential areas, municipal solid waste, wastewater and other defined key categories are key points in the qualitative assessment of uncertainties.	By 2026, that is, in the next BTR report, a qualitative assessment of uncertainties will be provided. For this, it is planned to hold a series of trainings on the 2006 IPCC Guidelines for the experts of the relevant institutions under the coordination of MENR.

5. Key category analysis As per sub-section 25 of section 2 of the MPG, Azerbaijan, as a developing country, applies the flexibility to define key categories by using a threshold not lower than 85% instead of the 95% threshold specified in the IPCC Guidelines.	The determination of the key categories at a level not lower than 85% is mainly explained by the lack of resources and time constraints.	Currently, domestic procedures are being implemented in the country to make relevant changes in the legislation on the GHG inventory. This process is expected to be completed by 2025, with the adoption of the relevant legal normative documents. In this regard, it is planned to conduct a series of trainings on the 2006 IPCC Guidelines with the participation of all relevant institutions. The issue of determining the key categories is one of the main components of these action plans.	In the next BTR reports, an inventory will be conducted according to the 2006 IPCC and UNFCCC Guidelines and the country will address the determination of the key categories at the 95% threshold in its 2nd BTR document and will present the data in its next reports.

Table 9. Areas where flexibility is applied in the National inventory on the anthropogenic emissions and absorptions of greenhouse gases

2. Trends in greenhouse gas emissions and removals

Overview

This chapter provides an analysis of trends in greenhouse gas (GHG) emissions and removals in Azerbaijan, covering both long-term developments since the 1990 base year and recent changes in the latest inventory years. The analysis is based on the most recent national GHG inventory estimates and is structured in accordance with the sectoral categories used in the Common Reporting Tables (CRTs) under the Enhanced Transparency Framework (ETF). Structure Overview

- Section 2.1. includes an overarching analysis of total GHG emissions and removals at the national level, highlighting key patterns over time.
- Sections 2.1.1 to 2.1.5 delve into sector-specific analyses, following the sectoral classifications mandated by the Common Reporting Tables (CRT). The sectors include:
    - Energy
    - Industrial Processes and Product Use (IPPU)
    - Agriculture
    - Land Use, Land-Use Change, and Forestry (LULUCF)
    - Waste

Each sectoral section is organized into two main subsections:

1. Historical Trend Analysis:

   This subsection examines long-term trends in GHG emissions and removals across key categories. The analysis follows the classification system provided by the Intergovernmental Panel on Climate Change (IPCC), indicating how sectoral activities have evolved since the 1990 baseline. This historical perspective helps understand the development of the sectors, identifying key turning points, and structural shifts.

2. Recent Trend Analysis:

   The recent trend analysis focuses on developments during the latest reporting cycle, covering the five reporting years (2020-2024). This section follows the CRT sectoral categories, as mandated by the MPG. It highlights recent fluctuations in emissions and removals, as well as the emerging trends in each sector.

The inclusion of both historical IPCC classifications and CRT-based reporting ensures that both historical and current trends are presented coherently, facilitating a more detailed understanding of sectoral developments enabling continuity with earlier inventories.

2.1. Description of trends in emissions and removals by sectors and gases

Azerbaijan's GHG emission profile has undergone substantial changes since 1990. The long-term time series reflects the structural economic transition of the 1990s, subsequent economic recovery, and changes in the composition and level of activity across the Energy, IPPU, Agriculture and Waste sectors. The structure of Azerbaijan's energy system and the continued importance of oil and gas production remain key factors shaping the national emissions profile, while developments in transport, industrial production, agricultural activity and waste generation also influence sectoral trends.

Since 1990, Azerbaijan has experienced wide-ranging economic, demographic and structural changes. Progress has been achieved in a number of areas, including improvements in energy efficiency and land management practices. At the same time, the national inventory reflects the continued importance of sectors such as oil and gas production, transport, agriculture and waste management in determining the evolution of national GHG emissions.

The collapse of the Soviet Union in the early 1990s led to a sharp decline in Azerbaijan's industrial and energy sectors, resulting in a significant reduction in emissions. However, as Azerbaijan's

economy rebounded in the 2000s thanks to oil and gas exports, emissions began to rise again, particularly in sectors such as transportation and waste.

As a major producer of oil and natural gas, Azerbaijan's energy and emissions profile continues to be influenced by hydrocarbon extraction and processing. Oil and gas activities, including venting, flaring and fugitive emissions, remain important components of Energy sector emissions.Although emissions have slightly decreased since 1990 due to improved technologies, this sector continues to be the primary source of Azerbaijan's GHG emissions. Total Energy sector emissions in 2024 were 25.56% below their 1990 level of 80.158 Mt CO_2 eq and decreased by a further 4.06% compared with 2023.

Urban development, economic activity and increasing mobility, particularly in and around Baku, have been accompanied by changes in transport activity, energy demand and waste generation. These factors affect different inventory categories in different ways and are examined in greater detail in the relevant sectoral trend analyses rather than being attributed to a single underlying driver at the national level.

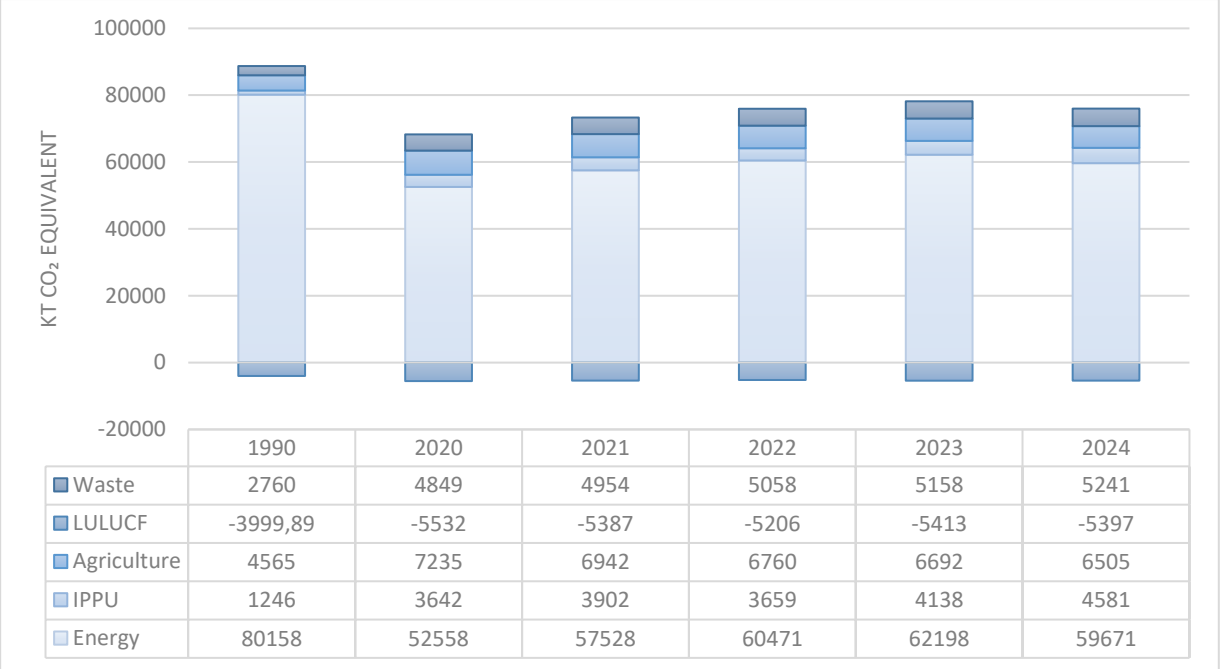
Agricultural activity has also changed substantially since 1990. In the post-Soviet period, significant emissions from enteric fermentation and manure management have been released due to the increase in livestock in Azerbaijan. Meanwhile, whilst sustainable land management practices have helped improve carbon sequestration in cropland, overgrazing and poor land management practices have led to setbacks in grasslands, turning them from a source of carbon absorption into a significant source of carbon emissions. More recently, however, Agriculture sector emissions have followed a declining trend, falling in each year from 2020 to 2024.

On the other hand, efforts to improve land management in croplands have significantly enhanced their carbon sequestration capacity, making a positive contribution to the LULUCF sector. However, the transformation of grasslands from a carbon sink into a source of emissions highlights the challenges in sustainably managing natural resources. The inventory indicates that grasslands have, during parts of the time series, shifted from net removals towards net emissions, highlighting the sensitivity of land-sector carbon stocks to land-use and management conditions.

	1990	2020	2021	2022	2023	2024	1990-2024 difference, %	2023-2024 Difference, %
Energy	80.158	52.558	57.528	60.471	62.198	59.671	−25.56%	−4.06%
IPPU	1.246	3.642	3.902	3.659	4.138	4.581	+267.53%	+10.72%
Agriculture	4.565	7.235	6.942	6.760	6.692	6.505	+42.52%	−2.78%
LULUCF[4]	-4.000	−5.532	−5.387	−5.206	−5.413	−5.397	+34.94% removals	−0.28% removals
Waste	2,760	4.849	4.954	5.058	5.158	5.241	+89.93%	+1.62%
Net emissions	**84.729**	**62.752**	**67.939**	**70.741**	**72.772**	**70.601**	**−16.67%**	**−2.98%**
Total emissions	**88.728**	**68.283**	**73.327**	**75.947**	**78.185**	**75.998**	**−14.35%**	**−2.80%**

Table 10. GHG emissions and removals by sectors, Mt CO_2 eq.

[4] As data for the 1990 base year is unavailable, removals for the harvested wood products (HWP) category were not calculated.



	1990	2020	2021	2022	2023	2024
Waste	2760	4849	4954	5058	5158	5241
LULUCF	-3999,89	-5532	-5387	-5206	-5413	-5397
Agriculture	4565	7235	6942	6760	6692	6505
IPPU	1246	3642	3902	3659	4138	4581
Energy	80158	52558	57528	60471	62198	59671

Figure 3. Total emissions by sectors, including LULUCF

The Energy sector remains the dominant source of national GHG emissions. In 2024, Energy emissions amounted to 59.671 Mt CO_2 eq, accounting for approximately 78.5% of total emissions excluding LULUCF. Despite its continuing importance in the national emissions profile, Energy sector emissions were 25.56% below their 1990 level of 80.158 Mt CO_2 eq. The 4.06% decrease compared with 2023 was the principal contributor to the overall reduction in national emissions in the latest inventory year.

The Agriculture sector was the second-largest emitting sector in 2024, accounting for approximately 8.6% of total emissions excluding LULUCF. Agriculture emissions amounted to 6.505 Mt CO_2 eq, remaining above the 1990 level. However, the recent trend has been consistently downward: emissions declined from 7.235 Mt CO_2 eq in 2020 to 6.505 Mt CO_2 eq in 2024, a reduction of approximately 10.1%, including a further 2.78% decrease between 2023 and 2024.

The IPPU sector reflects a more diversified set of emission sources than in the 1990 base year. In addition to process-related CO_2 emissions from mineral, chemical and metal industries, the sector now includes fluorinated gases associated with activities such as refrigeration and air-conditioning and PFC emissions from aluminium production. IPPU emissions amounted to 4.581 Mt CO_2 eq in 2024, representing approximately 6.0% of total national emissions excluding LULUCF.

The comparatively large percentage increase from the 1990 level partly reflects the expansion of the range and level of industrial activities and gases represented in the sectoral inventory. In 2024, HFC and PFC emissions together amounted to approximately 0.788 Mt CO_2 eq, equivalent to around 17% of total IPPU emissions. Overall IPPU emissions increased by 10.72% compared with 2023.

The Waste sector accounted for approximately 6.9% of total emissions excluding LULUCF in 2024. Emissions increased from 2.760 Mt CO_2 eq in 1990 to 5.241 Mt CO_2 eq in 2024. The underlying activity drivers and category-specific trends are considered in greater detail in the Waste sector analysis.

The LULUCF sector remained a net sink throughout the years presented. Net removals amounted to approximately 5.397 Mt CO_2 eq in 2024, compared with approximately 4.000 Mt CO_2 eq in 1990. The magnitude of reported net removals in 2024 was therefore approximately 34.94% greater than in the base year, while remaining broadly stable compared with 2023.

This comparison should, however, be interpreted with appropriate methodological context. Activity data required to estimate removals from Harvested Wood Products (HWP) were not available for the 1990 base year and, consequently, HWP removals were not estimated for 1990. HWP removals are included in the later inventory years. Accordingly, part of the difference between reported LULUCF removals in 1990 and subsequent years reflects differences in category coverage in addition to underlying changes in land-sector emissions and removals.

Table 10 therefore shows that increases in emissions in several non-Energy sectors since 1990 have occurred alongside a substantial long-term reduction in Energy sector emissions.

Azerbaijan's contribution to global GHG emissions also remains comparatively small. According to the UNEP Emissions Gap Report 2025, global GHG emissions reached 57.7 Gt CO_2 eq in 2024, an increase of 2.3% compared with 2023. For contextual comparison, Azerbaijan's net national emissions of 70.601 Mt CO_2 eq, including LULUCF, represented approximately 0.1% of estimated global GHG emissions in 2024 (UNEP, 2025).

Trends by gas

Carbon dioxide (CO_2) continues to account for the largest share of Azerbaijan's GHG emissions. Table 11 presents emissions of CO_2, CH_4, N_2O, HFCs and PFCs excluding the LULUCF sector, expressed in CO_2-equivalent terms.

Gas/ Year	1990	2020	2021	2022	2023	2024	1990-2024 difference, %
CO_2	57.175	42.292	45.072	47.043	49.022	46.000	−19.54%
CH_4	30.405	23.525	25.986	26.783	26.793	27.671	−8.99%
N_2O	1.149	1.809	1.539	1.438	1.678	1.539	+33.99%
HFCs	NE	0.490	0.535	0.549	0.578	0.584	NA
PFCs	0.000083	0.167	0.194	0.134	0.114	0.204	*
Total emissions, excluding LULUCF	**88.728**	**68.283**	**73.327**	**75.947**	**78.185**	**75.998**	**−14.35%**

Table 11. GHG emissions by gases, excluding LULUCF, Mt CO_2 eq.

** The percentage change in PFC emissions relative to 1990 is not presented because the base-year emission level was negligible (approximately 0.000083 Mt CO_2 eq), which would result in a disproportionately large percentage change that is not informative for interpretation of the national trend.*

As shown in Table 11, CO_2 remained the principal GHG in Azerbaijan's national emissions profile. CO_2 emissions excluding LULUCF amounted to 46.000 Mt CO_2 eq in 2024, remaining 19.54% below the 1990 level of 57.175 Mt CO_2 eq. CH_4 emissions amounted to 27.671 Mt CO_2 eq, approximately 9.0% below their 1990 level, while N_2O emissions amounted to 1.539 Mt CO_2 eq, approximately 34.0% above the base-year level.

Fluorinated gases have become a more visible component of the national inventory in recent years. HFC emissions amounted to 0.584 Mt CO_2 eq in 2024 and were mainly associated with relevant IPPU applications, including refrigeration and air-conditioning. A comparison with 1990 is not possible because HFC emissions were not estimated for the base year. PFC emissions amounted to 0.204 Mt CO_2 eq in 2024 and were primarily associated with aluminium production. The very large relative increase compared with 1990 reflects the negligible PFC emission level recorded in the base year and should therefore be interpreted in the context of this very low starting point.

Together, HFCs and PFCs accounted for approximately 0.788 Mt CO_2 eq in 2024, or around 1.0% of total national GHG emissions excluding LULUCF. Their inclusion in Table 11 provides a more complete representation of the national emissions profile and ensures consistency with the gases reported in the relevant IPPU categories and CRTs.

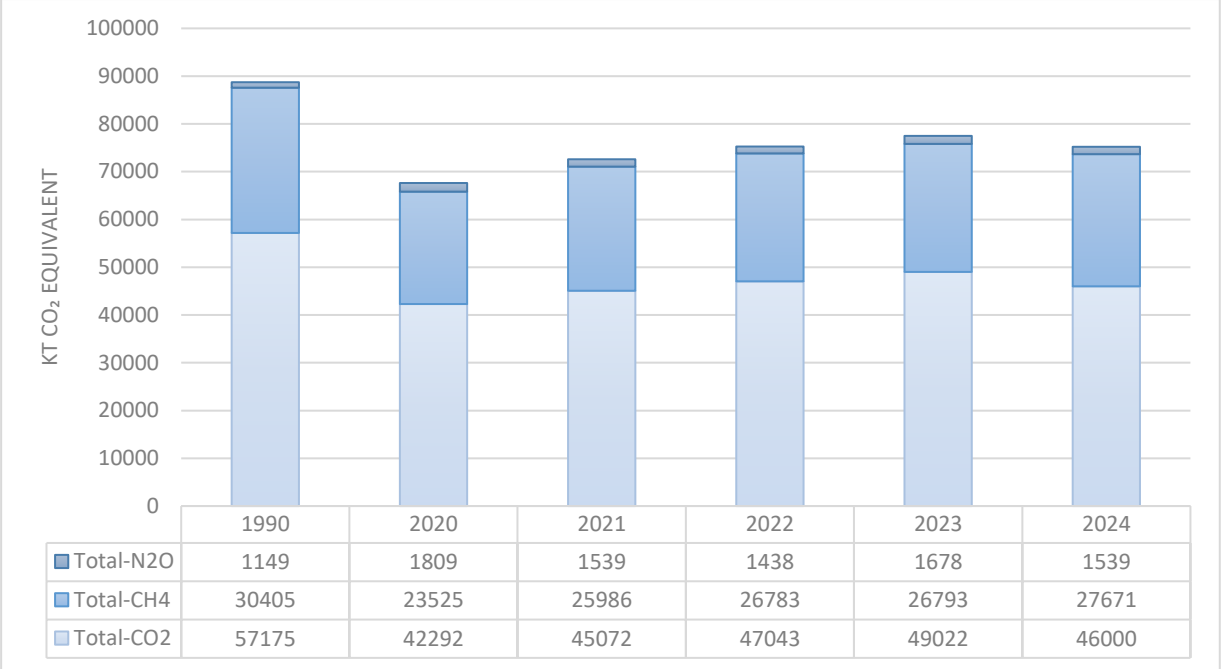


Figure 4. Total emissions by gases, excluding LULUCF

Overall, the updated inventory indicates that Azerbaijan's net GHG emissions in 2024 were 16.67% below the 1990 base-year level of 84.729 Mt CO_2 eq, while total emissions excluding LULUCF were 14.35% below the 1990 level of 88.728 Mt CO_2 eq. The latest year also recorded a decline in both total and net national emissions compared with 2023. The long-term reduction continues to be strongly influenced by the Energy sector.

- **1990:** 88,728 kt CO_2 equivalent
- **2024:** 75,998 kt CO_2 equivalent
- **Change:** Decrease of 14.35%

Including LULUCF

- **1990:** 84,728kt CO_2 equivalent
- **2024:** 70,601kt CO_2 equivalent
- **Change:** Decrease of 16.67%

Trend: Azerbaijan's GHG emission profile has undergone substantial changes since 1990. The long-term time series reflects the structural economic transition of the 1990s, subsequent economic recovery, and changes in the composition and level of activity across the Energy, IPPU, Agriculture, LULUCF and Waste sectors. The sharp economic contraction following the dissolution of the Soviet Union resulted in a substantial decline in industrial production and energy demand during the 1990s, followed by a gradual increase in emissions as economic activity recovered from the 2000s onwards. Nevertheless, the latest inventory shows that national GHG emissions in 2024 remained below their 1990 base-year level. The structure of Azerbaijan's energy system and the continued importance of oil and gas production remain key factors shaping the national emissions profile, while developments in transport, industrial production, agricultural activity, land use and waste generation also contribute to sectoral trends. At the same time, improvements in energy efficiency, changes in the structure of economic activity and continued net removals from the LULUCF sector have influenced the evolution of the national GHG balance.

The latest inventory results also show an improvement in the most recent year. Between 2023 and 2024, total emissions excluding LULUCF decreased by 2.80%, while net emissions including LULUCF decreased by 2.98%. The Energy sector was the principal contributor to this year-on-year reduction, with emissions decreasing by 4.06%.

As part of the current report, the inventory for the 1990 base year has been recalculated and the inventory time series has been updated through 2024 using the latest available activity data and methodological improvements. The results of the inventory by sector are presented in Figure 3. In 2024, net national GHG emissions, including LULUCF, amounted to 70.601 Mt CO_2 eq, representing a 16.67% decrease compared with 84.729 Mt CO_2 eq in the 1990 base year.

Excluding LULUCF, total GHG emissions amounted to 75.998 Mt CO_2 eq in 2024, which was 14.35% below the 1990 level of 88.728 Mt CO_2 eq. As shown in Figure 3, the Energy sector continued to account for the largest share of national GHG emissions. Energy sector emissions amounted to 59.671 Mt CO_2 eq in 2024, representing a decrease of 25.56% compared with the 1990 level of 80.158 Mt CO_2 eq and 4.06% compared with 2023. The long-term reduction in Energy sector emissions therefore remains the principal factor underlying the lower level of national emissions relative to the base year.

Changes in agricultural activity since 1990, including growth in livestock populations during parts of the post-Soviet period, have contributed to higher emissions from enteric fermentation and manure management compared with the base year. At the same time, developments in land use and land management have influenced the balance of emissions and removals within the LULUCF sector. Improvements in carbon sequestration in some cropland areas have contributed positively to net removals, while changes in grassland carbon stocks have, during parts of the time series, resulted in a shift from net removals towards net emissions. These trends underline the importance of sustainable land and pasture management for maintaining and enhancing carbon sinks. Changes in agricultural production and demand for food products, together with demographic and economic developments, have also influenced activity levels within the Agriculture sector.

The overall reduction in national GHG emissions relative to the 1990 base year is primarily associated with the substantial decline in emissions from the Energy sector, which continues to account for the largest share of total national emissions. At the same time, emissions from several non-Energy sectors have increased relative to their base-year levels, reflecting changes in economic activity, sectoral structure and the composition of emission sources over time.

Emissions from the Industrial Processes and Product Use (IPPU) sector arise from industrial processes and product use, including mineral, chemical and metal production, as well as emissions of fluorinated gases. As shown in Figure 3, IPPU emissions increased from 1.246 Mt CO_2 eq in 1990 to 4.581 Mt CO_2 eq in 2024. The resulting increase of 267.53% should be interpreted in the context of the comparatively low base-year level, developments in industrial production and changes in the composition of emission sources represented in the sector, including the increasing contribution of HFCs and PFCs in recent years. In 2024, IPPU emissions increased by 10.72% compared with 2023.

The Agriculture sector remained the second-largest emitting sector after Energy in 2024, with emissions of 6.505 Mt CO_2 eq. Although emissions were 42.52% above the 1990 level, the recent trend has been downward, with emissions decreasing in each year from 2020 to 2024 and declining by 2.78% between 2023 and 2024.

The Waste sector also shows a long-term increasing trend. Emissions increased from 2.760 Mt CO_2 eq in 1990 to 5.241 Mt CO_2 eq in 2024, representing an increase of 89.93%. This trend reflects changes in waste generation, disposal and wastewater-related activity over the inventory period, which have been influenced by broader demographic and economic developments. The increase in the most recent year was comparatively moderate, at 1.62% between 2023 and 2024.

The updated inventory indicates substantial long-term reductions in national GHG emissions, driven primarily by the Energy sector, while emissions in several other sectors have evolved in line with changes in economic activity, production patterns and the composition of emission sources. Continued efforts to maintain reductions in the Energy sector and address emission trends in other sectors will therefore remain important for the evolution of Azerbaijan's national GHG emissions profile.

As shown in Figure 4, CO_2 remains the largest contributor to national GHG emissions. In 2024, CO_2 emissions excluding LULUCF amounted to 46.000 Mt CO_2 eq, representing a 19.54% decrease compared with the 1990 level of 57.175 Mt CO_2 eq. CH_4 emissions amounted to 27.671

Mt CO_2 eq, remaining approximately 9.0% below the 1990 level, while N_2O emissions amounted to 1.539 Mt CO_2 eq, approximately 34.0% above the base-year level. Fluorinated gases have also become a more visible component of the national emissions profile in recent years and are reported within the relevant IPPU categories.

Overall, the latest inventory results show that Azerbaijan's net GHG emissions, including LULUCF, amounted to 70.601 Mt CO_2 eq in 2024 and remained 16.67% below the 1990 base-year level of 84.729 Mt CO_2 eq. Total GHG emissions excluding LULUCF amounted to 75.998 Mt CO_2 eq, or 14.35% below the 1990 level of 88.728 Mt CO_2 eq. The latest inventory year also recorded a decrease compared with 2023, with total emissions excluding LULUCF declining by 2.80% and net emissions including LULUCF by 2.98%.

2.1.1. Energy Sector

2.1.1.1. HISTORICAL TREND IN ENERGY SECTOR

The energy sector encompasses all areas of human activity.

The central executive authority responsible for implementing state policy and regulation in the fuel-energy complex is the Ministry of Energy of the Republic of Azerbaijan. "Azerenerji" JSC is responsible for electricity production, while the State Oil Company of the Republic of Azerbaijan (SOCAR) oversees the oil and gas sector.

The Energy sector has the largest share of GHG emissions in Azerbaijan. In the latest inventory year, 2024, Energy-sector emissions amounted to 59.671 Mt CO_2 eq, accounting for approximately 78.5% of the country's total GHG emissions excluding LULUCF.

According to the IPCC (2006) methodology, the energy sector encompasses three key categories:
1. Fuel combustion (1.A.);
2. Fugitive emissions from fuel (1.B.);
3. Transportation and storage of carbon dioxide (1.C.).

Currently, in Azerbaijan, activities exist for two of these categories: "Fuel combustion" and "Fugitive emissions from fuels." Although no activities are being conducted in the category of carbon dioxide transport and storage, there are favourable conditions for carbon capture and storage.
As seen in Figure 5 of the next section below, GHG emissions from the energy sector in 1990 were 80,158 kt CO_2 equivalent. In the most recent inventory year, 2024, this figure decreased by 25.56%, reaching 59,670.7kt CO_2 equivalent.

The trend analysis results show that the reduction in GHG emissions from the Energy sector in the 1990s was mainly due to the significant decline in energy production in Azerbaijan following the collapse of the Soviet Union in 1991. The subsequent recovery of the economy, together with reforms in the energy sector, particularly improvements in energy efficiency in energy production, contributed to this reduction.

The trend analysis results show that the reduction in GHG emissions from the Energy sector in the 1990s was mainly due to the significant decline in energy production in Azerbaijan following the collapse of the Soviet Union in 1991. The subsequent recovery of the economy, together with reforms in the energy sector, particularly improvements in energy efficiency in energy production, contributed to this reduction.

1.A - Fuel combustion category. This category of the energy sector includes the following subcategories:

1.A.1 - Energy industry;

1.A.2 - Industry and construction;

1.A.3 - Transport;

1.A.4 - Other sectors.

Data on total GHG emissions from fuel combustion and GHG emissions into the atmosphere from its subcategories are given in the table below.

Fuel combustion in the country's energy system (1.A) includes electricity generation, facilities producing both heat and electricity, as well as facilities generating only heat. Since no limitations are applied in statistical data collection for such systems, this category also includes very small systems within the residential and commercial/institutional sectors. Additionally, oil and gas are burned during the production and processing of oil and gas in the country.

Indicators	1990	2020	2021	2022	2023	2024	1990-2024 difference, %
1.A – Fuel combustion	55,037.05	35,244.83	37,895.65	40,376.71	42,279.43	39,111.52	−28.94%
1.A.1 – Energy industry	23,017.51	15,686.31	17,157.93	16,881.21	17,054.17	14,218.51	−38.23%
1.A.2 – Industry and construction	15,391.41	2,410.53	2,315.67	2,896.64	2,968.05	2,843.03	−81.53%
1.A.3 – Transport	6,091.53	6,932.53	7,777.90	9,241.62	9,974.51	10,765.84	+76.74%
1.A.4 – Other sectors	10,536.60	10,215.46	10,644.16	11,357.25	12,282.71	11,284.13	+7.09%

Table 12. GHG emissions from fuel combustion, kt CO_2 eq.

This category takes into account the fuel use in thermal power plants associated with electricity production. The data from the open sources of the State Statistics Committee (SSC) has been used.

1.A.1 - Energy industry. The energy industry includes oil and gas production, processing, distribution, electricity and heating. Oil production in Azerbaijan dates back to 1846, and electricity production to the end of the XIX century.

The energy industry includes the production of electric and thermal energy, oil refining, as well as solid fuel and other areas. The decrease in GHG emissions in the energy industry subcategory is related to the transition to modern technologies in the energy sector, improved energy efficiency, and most importantly, the shift from fuel oil to natural gas.

GHG emissions from Energy Industries declined substantially over the inventory period, from 23,017.51 kt CO_2 eq in 1990 to 14,218.51 kt CO_2 eq in 2024 (−38.23 %). Public Electricity and Heat Production remained the dominant source.

1.A.1.a.i. Electricity generation

The first stage in the development of electric power engineering

The development of electric power engineering in Azerbaijan dates back to the 19th century. In 1897, for the first time, a 550 kW power plant was built in the oil region of Baku by the Nobel brothers. In 1901, Bibiheybat power plant, with a capacity of 2000 horsepower was commissioned and in 1902, in the Black City (now known as the White City), another 2000 hp power station was put into operation. In 1913, Baku produced 109,800 kWh of electricity, of which 95% was used by the oil industry and only 5% for the country's lighting.

The total capacity of two large power plants of the "Electric Power" Joint Stock Company, operating on the eve of the First World War was 45.7 MW. The capacity of the largest of these stations - the one in Black City - was 34.4 MW. In 1920, few power plants were nationalised. The nationalised energy enterprises included two thermal power plants in the Black City and the Bayil area and a distribution network with an output of 0.4-2.0kW. The commissioning of three turbo aggregates, 20

MW each, in Bayil and in the Black City, the reconstruction of existing power plants and the switching of power plants to gas-fired were intended for the complete electrification of oil extraction and refining in Baku.

In response to the development of the silk-weaving industry in Shaki, there was designed Shaki Hydroelectric Power Station, with a capacity of 1660 kW. In connection with the construction of a canning plant in Guba, a hydroelectric power station with the capacity of 1152 kW was built. Zurnabad and Gusar hydroelectric power stations were also built and put into operation. By 1935, the total capacity of power plants reached 176.6 MW, with a production of electricity up to 937,000 kWh. In the same year, the country's main energy department - currently “Azerenergy” - was established, with all energy enterprises operating in the country subordinated to it.

The drilling and exploitation of deep oil wells in the 1940s necessitated an increase in the power of the energy system and the commissioning of new power facilities. During these years, the State District Power Station named after Krasin (SDPS named after Krasin) in Bayil settlement and the Red Star Thermal Power Station (now known as Baku TPP No. 1 named after A. Bayramzada(eh)) were commissioned. By 1940, the capacity of all existing power plants in the country reached 250 MW, with electricity production rising to 1.7 billion kWh. And in 1941, Sumgayit Thermal Power Plant No. 1 was put into operation.

Transition to a system of purposeful use of water and energy resources in the republic begins with the construction of the Mingachevir Reservoir (water junction). In 1954, Mingachevir Hydroelectric Power Station (HPS) was commissioned. Three years later, Varvara HPS, included in this water reservoir's complex, started to operate. Located 14 km downstream and with a capacity of 16.5 MW, the station serves as a water consumption regulator on the water from the Mingachevir Hydroelectric Power Station. In April 2017, Varvara HPS was put back into operation after reconstruction.

The first phase of “Shimal” SDPS, with an installed capacity of 168.8 MW, was commissioned in 1954. In 1960, this power station saw the commissioning of the first open-type power unit for the first time in the USSR, with a capacity of 150 MW. In 1962, the 11th turbine section of Sumgayit Thermal Power Station No. 1 was put into operation, increasing its total capacity to 450 MW.

In 1959, the construction of Ali-Bayramli State District Power Station (now Shirvan Thermal Power Plant), of which major equipment was installed in the open air for the first time in Europe, began in Ali-Bayramli city. Commissioning of the first phase of the four-unit power station, with a capacity of 150 MW each, not only met Azerbaijan's demand for electricity but also enabled the transmission of 1.7 million kWh of electricity to the neighbouring South Caucasus republics in 1964-1965.

Around the same time, in response to the growing demand for heating and electricity in Sumgayit, construction of Sumgayit Thermal Energy Center No. 2 (Sumgait TEC No. 2) started. The first turbine section was put into operation in 1966 and the other in 1972, making the total installed capacity of the station 220 MW.

The second stage in the development of electric power engineering (1969-1991)

The foundation of the independent electricity system of Azerbaijan was laid in the 70s of the last century.

In 1970, in the territory of the Nakhchivan Autonomous Republic, the Araz Water Junction and two hydroelectric power stations, each with a capacity of 22 MW, were built and put into operation on the Araz River.

In 1971-1972, the Sumgayit Thermal Power Station No. 2 was expanded and two new turbine units with a total capacity of 110 MW were put into operation and the total capacity of the station was increased to 220 MW. In 1973-1974, the installation of two turbine units, each with a capacity of 50 MW, was completed at Thermal Power Station No. 1.

In 1976-1977, the Tartar Water Junction and Tartar Hydroelectric Power Station (Tartar HPS), with an installed capacity of 50 MW, were put into operation on the Tartar River.

By the end of the 1970s, the total installed capacity of electric power stations in the republic reached 2,882.4 MW, producing 15.4 billion kWh of electricity annually across the country.

However, Azerbaijan had to import $2.9-3.5 billion kWh of electricity annually from neighboring countries to meet its growing electricity demand. As a result, it was decided to build Shamkir Hydroelectric Power Station (Shamkir HPS) and Azerbaijan State District Power Station (Azerbaijan SDPS). Thus, Shamkir HPS, with an installed capacity of 380 MW, was constructed between 1981 and 1982. The construction of Azerbaijan SDPS began in 1974. The first power unit with a capacity of 300 MW was put into operation in 1981 and the last, the eighth one with the same capacity, in 1989. Currently, the installed capacity of the station is 2,400 MW. After the commissioning of Shamkir HPS and Azerbaijan SDPS, the total installed capacity of the energy system reached 5,000 MW.

In addition to the commissioning of power stations, power transmission line systems and substations were also constructed.

In 1976-1977, Sarsang Reservoir and a 50 MW hydropower station with the same name (Sarsang HPS) were commissioned on the Tartar River to improve agriculture, to create a reservoir for the irrigation of fertile soils, to improve the electric power supply of the region and to reduce losses in energy transmission in Karabakh region.

In the 1980s, electric lines were laid in all residential areas of Azerbaijan. During this period, along with the construction of power plants, the power grid was also systematically developed and a stable power system was created in the country. In 1968-1971, Ali-Bayramli SDPS-Aghdam-Ganja-Aghstafa, with a capacity of 330 kV, and Ali-Bayramli SDPS-Yashma-Derbent high voltage power lines, as well as “Yashma”, “Ganja” and “Aghstafa” junction substations with respective capacities of 330, 110 and 20 kV were put into operation.

Construction of the Azerbaijan TPS opened a new stage in the development of the energy network of the country. The first and second Absheron Electric Transmission Line (ETL), Mukhranis-Vali ETL and the fourth and fifth Mingachevir ETLs, with a capacity of 500 kV, were built. In the 1980s, junction substations such as “Absheron”, with a capacity of 500, 330 and 220 kV, “Imishli” with 330, 110 and 10 kV capacities and “Hovsan”, “Nizami”, “Mushfig”, “Sangachal”, “Masalli”, “Aghsu” and “Babak”, all with capacities of 220, 110 and 10 kV were commissioned, as well as the third Ali-Bayramli Electric Transmission Lines, with a capacity of 330 kV, was put into operation.

Development of electric power engineering after gaining independence (the third stage after 1991)

The collapse of the Soviet Union affected power engineering system as well. However, strategic policies aimed at establishing mutually advantageous relations with the leading countries of the world has created opportunities for attracting foreign investments into the power engineering system, which have been and are being purposefully utilized to enhance the efficiency of the existing potential of Azerbaijan`s power system, to reconstruct the electric power engineering economy and develop new power sources.

A new stage of development in the energy system was started with the completion of the construction of Yenikend Water Reservoir and Hydroelectric Power Station, which was the continuation of the unfinished Shamkir Hydroelectric Power Station, begun in 1984. The station was put into commission in December 2000 thanks to a loan amounting $53.2 million allocated by the European Bank for Reconstruction and Development and hard work of the republic's power engineers and builders.

Thanks to a loan from Deutsche Landesbank of Germany, two modern steam-gas turbines, each with a capacity of 53 MW, were installed and commissioned at Baku Thermal Power Station No. 1.

Azerbaijan's national energy system has been closely linked with the energy systems of the Russian Federation, the Islamic Republic of Iran and Georgia, as well as Türkiye through

Nakhchivan Autonomous Republic. This is also one of the major factors contributing to the further development of mutual relations between the countries and maintaining peace, stability and security in the region.

Decrees of the President of the Republic of Azerbaijan, Ilham Aliyev, on the “State Programme for the Development of the Fuel and Energy Complex of the Republic of Azerbaijan (2005-2015)” and “Additional Measures to Improve the Electricity Supply in the Republic of Azerbaijan” marked the beginning of a new era in the modern development stage of power engineering.

For the first time in the CIS, commissioning modern gas-turbine type Shimal-1 with a capacity of 400 MW along with the construction of eight modular power stations with a total capacity of 872.5 MW (including Nakhchivan AR) in various regions of the country, has initiated a new rise in the energy sector, thus, the installation of systemically important power transmission lines and substations has eliminated the disproportion in power supply for industrial centers. The modern Sumgayit steam-gas type power plant was put into commission in 2009, with a capacity of 525 MW, followed by the same type “Janub” PS in 2013, with a capacity of 780 MW. With a capacity of 400 MW, the Shimal-2 Power Station, which is located in Shuvalan settlement and play a significant role in improving the stability and quality of electricity supply in the Absheron peninsula, was put into operation on 5 September 2019. Besides, on 11 February 2022, the Gobu Energy Hub - the 330/220/110 kV Gobu substation, with a load capacity of 1000 megawatts and the 385 MW Gobu Power Station were commissioned.

After the liberation of our lands in Karabakh and Eastern Zangezur in 2020, large-scale restoration and construction works for the revival of these territories have been started and are being successfully continued.

Stations and substations were reconstructed and put into operation in the liberated territories. Thus, on February 14, 2021, in the Gulabird village of Lachin region, the small hydroelectric power plant “Gulabird”, with a capacity of 8 MW, which had been completely rendered unusable during the occupation, was put into operation after restoration. Sugovushan Hydroelectric Power Stations (SHPS-1 with a capacity of 4.8 MW and SHPS-2 with a capacity of 3.0 MW) series with a total capacity of 7.8 MW was restored and put into operation in the Sugovushan settlement of Tartar on 3 October 2021. “Kalbajar -1” Small Hydroelectrik Power Station on the Lev River, with a capacity of 4.4 MW, was put into operation on 26 June 2022 after reconstruction. On 27 May 2023, digital junction substations 110/35/10 kV Lachin City with a capacity of 2x40 MVA and 110/35/10 kV Gorchu with a capacity of 2x25 MVA were put into operation. On 27 May 2023, “Meydan” with a capacity of 3.4 MW, “Gamishli” with a capacity of 6.3 MW, and on 25 August 2023, “Soyuqbulag” with a capacity of 5.3 MW, “Chirag-1” with a capacity of 8.3 MW, “Chirag-2” with a capacity of 3.6 MW were commissioned after reconstruction. Reconstruction of 3 small hydroelectric power stations with a total capacity of 28.5 MW (“Aghbulag” with a capacity of 14.25 MW, “Alkhasli” with a capacity of 6 MW, “Mishni” with a capacity of 8.25 MW) have been completed in Lachin region. On 25 August 2023, 6 MW “Alkhasli” and 8.25 MW “Mishni” small hydroelectric power stations were commissioned. The construction of 4 small hydroelectric power stations with a total capacity of 42 MW (“Shayifli”, “Sarigishlag”, “Zangilan” and “Jahangirbeyli” with a capacity of 10.5 MW each) has been completed in Zangilan. On 28 September 2023, Jahangirbeyli SHPS was put into operation.

On 4 May, 2023, within the establishment of the first stage of the Azerbaijan-Türkiye-Europe Energy Corridor project - 330/110/10 kV “Jabrayil” energy hub, “Jabrayil” substation with a capacity of 2x250 MVA was built and put into operation. As of 24 September 2023, there was built a new 0.3 km long line from 110/35/10 kV “Shusha” substation, with a capacity of 2x25 MVA, which was connected to the existing 110 kV “Gorus-Khankendi” electric power transmission line and commenced the transmission of power supply in the direction of the city of Khankendi. In addition, 110 kV substations of various capacities were built and put into operation in Fuzuli, Kalbajar, Jabrayil, Zangilan, Gubadli, Aghdam regions and Shusha.

Azerbaijan, which guarantees the safety of its electric power engineering, has been exporting electricity to neighboring countries since 2007. Thus, the growing role of Azerbaijan in the world energy market is increasing its geopolitical influence. In November 2011, Azerbaijan signed the “Memorandum of Understanding on Energy Cooperation between Azerbaijan and the European

Union” and began to adapt this field to international standards. Measures are being taken to adapt the legislative base to the Directive and Regulation of the European Parliament related to the reforms to be carried out in the field of energy. In this regard, the laws of the Republic of Azerbaijan “On the efficient use of energy resources and energy efficiency” and “On the use of renewable energy sources in the electricity production” were adopted, as well as the Law of the Republic of Azerbaijan “On Electric Power Engineering”, containing modern challenges in the field of electric power, was improved and re-adopted.

The reforms implemented in the field of electric power engineering in European countries since 1990 have ensured the de-monopolization of electricity and the creation of competitive conditions in the energy market, as a result of which there have been conditions for reducing electricity prices and losses and increasing the level of service.

Recent years have been rich in successes in increasing the stability of our electric power system and its development in a new context. With the commissioning of new power plants, the total installed capacity of our country has reached 8320.8 MW. At present, the electric power system includes 22 thermal power plants with a total capacity of 6633.0 MW, 46 hydroelectric power plants with a total capacity of 1301.8 MW, 5 wind power plants with a total capacity of 66.5 MW, 9 solar power plants with a total capacity of 281.8, a bioenergy power plant with a capacity of 37 MW, 3 hybrid power plants with a total capacity of 0.7 MW.

The capacity of power plants on renewable energy sources, including hydroelectric power plants, is 1687.8 MW, accounting for about 20.3% of the total installed capacity.

At the same time, Azerbaijan is successfully implementing and developing its energy policy in the international arena. Azerbaijan is already one of the active members of a number of international organizations, which also include the European Union countries, such as OSCE, Eastern Partnership, Black Sea Economic Cooperation (BSEC) and GUAM.

The Republic of Azerbaijan has relations with Russia, Georgia, Iran and Türkiye among the neighbouring countries in the field of electric power engineering, and imports and exports of electricity are carried out with those countries. The electricity transmission capacity to Russia is around 350 MW and to Iran around 550 MW.

The electricity transmission capacity of the 500 kV Samukh-Gardabani Overhead Power Transmission Line (OPTL), commissioned within the Azerbaijan-Georgia-Türkiye Energy Bridge project, is 650 MW.

There are 2 overhead power transmission lines between the energy systems of Azerbaijan and Georgia - 500 kV “Samukh-Gardabani” OPTL (electricity export from Georgia to Türkiye via transit) and 330 kV Aghstafa-Gardabani OPTL.

As part of the “Azerbaijan-Georgia-Turkey Energy Bridge Project”, Azerbaijan built the 500 kV Samukh-Gardabani OPTL, while Georgia completed the construction of the 500/400/220 kV “Akhaltsikhe” substation and the 400 kV OPTL connecting Georgia to Türkiye, which was put into operation at the end of 2013. Transmission of electricity through the 500 kV Samukh-Gardabani OPTL has commenced since February 2016.

According to the intergovernmental agreement “On cooperation in the field of power engineering” signed between the Republic of Azerbaijan and Georgia on 27.12.1997, the Agreement “On the parallel operation of the Georgian and Azerbaijani power systems” (05.08.1998) was concluded between the power systems of the Parties. This relationship between the power systems of Azerbaijan and Georgia is regulated on the basis of the Agreement on parallel operation concluded between the Parties by the decisions of the Joint Intergovernmental Commission on Economic Cooperation, Agreements on the purchase of electricity and on the transmission of electricity in case of emergency.

The energy systems of Azerbaijan and Russia have been connected through the two interstate OPTLs. These are 330 kV “Derbend” OPTL, which connects 330/110 kV “Khachmaz” (AR) and

330/110 kV “Derbend” (RF) substations and 110 kV “Yalama” OPTL connecting 110/35 kV “Yalama” (AR) and 110/35 kV “Bilici” (RF) substations.

The energy system of Azerbaijan operates in a parallel mode with the Unified Energy System of Russia in a single synchronous zone. Mutual relations between the parties are carried out in accordance with the Intergovernmental Agreement on Cooperation in the Field of Electric Power Engineering between the Republic of Azerbaijan and the Russian Federation, dated 7 October 1995.

The relationship between the energy systems of the Republic of Azerbaijan and the Russian Federation are regulated on the basis of the Agreement on parallel operation concluded between the Parties by the decisions of the Joint Intergovernmental Commission on Economic Cooperation, agreements on the sale and purchase of electricity and on the transmission of electricity in case of emergency.

Since December 2001, the import and export of electricity between the Parties has been of a purely commercial nature. The volume of electricity exported to the Russian Federation has been growing dynamically since 2007 and the energy system of Azerbaijan operates with a positive balance.

The energy exchange between the energy systems of the Republic of Azerbaijan and the Islamic Republic of Iran is carried out along five existing electric power transmission lines - the 330 kV “Mughan”, 230 kV “Imishli” and 110 kV “Astara-Astara” power transmission lines, owned by “Azerenergy” OJSC and the 132 kV “Araz-Araz” and 132 kV “Julfa-Julfa” power transmission lines, owned by the State Energy Agency of Nakhchivan. The current exchange power of electricity is 600 MW.

According to the Contract “On exchange and transit of electricity” signed between “Azerenergy” OJSC (AR) and “Tavanir” (IRI) (24.01. 2001) by the commissioning of 230 kV “Parsabad” PTL starting from February 2001, the electricity transmitted from IRI to Nakhchivan AR is carried out only in the form of energy exchange.

There are three overhead power transmission lines (OPTLs) between the energy systems of Azerbaijan and Türkiye - the 154 kV “Igdir-Nakhchivan No. 1”, the 154 kV “Igdir-Nakhchivan No. 2” and the 34.5 kV “Sadarak” OPTL).

The construction of the 140 MW (100+40) “Khudaferin” and “Giz Galasi” HPSs on the territory of Jabrayil region, located on the Araz River, are underway. Upon completion of the construction, it will be integrated into the energy system through the 330 kV network to be established.

The transformation of our country from an energy-importing country to an energy-exporting country is a clear result of the economic policy pursued in the energy industry.

In accordance with the targets set by the President of the Republic of Azerbaijan, measures are underway to increase the share of renewable energy in the installed capacity of electricity to 30% by 2030. On 29 December 2020, “Investment agreement”, “Power Purchase Agreement” and “Transmission Connection Agreement” were signed regarding the construction of a wind power plant with an installed capacity of 240 MW between the Ministry of Energy, “Azerenergy” OJSC and “ACWA Power” company of the Kingdom of Saudi Arabia. And on 6 April 2021, “Investment agreement”, “Power Purchase Agreement” and “Transmission Connection Agreement” were signed on the construction of 230 MW solar power station between the Ministry of Energy, “Azerenergy” OJSC and “Masdar” company of the United Arab Emirates, which was commissioned on 26 October 2023.

1.A.2 – Manufacturing Industry and construction. This subcategory includes all enterprises and construction facilities. In connection with the collapse of the former state of Soviets, the activity in the field of enterprises and construction facilities has begun to weaken since the 1990s. This was due to the violation of economic relations between the countries of the Soviet Union, the absence of competitive production facilities in the country. Since the 2000s, with the revival of the oil and gas industry, the activities of this industry have also begun to revive. New companies and

enterprises have begun to emerge. These industries are already equipped with modern equipment and competitively viable. Therefore, the amount of GHG from them into the atmosphere is small.

Subcategory	1990	2020	2021	2022	2023	2024	Δ 2024/1990
1.A.2 - Manufacturing & Construction	15391,4	2410,5	2315,7	2896,6	2968,0	2843,0	-81,53%
1.A.2.a Iron & steel	724.3	37.3	52.2	49.4	53.7	98.9	−86.35%
1.A.2.b Non-ferrous metals	1390.2	4.5	9.1	19.5	16.7	9.0	−99.35%
1.A.2.c Chemicals	2129.0	776.4	579.0	877.4	786.5	687.5	−67.71%
1.A.2.d Pulp, paper & print	4.0	4.6	5.3	5.5	3.7	3.7	−7.50%
1.A.2.e Food Processing, Beverages and Tobacco	1436.0	283.1	287.5	348.7	371.5	341.1	−76.25%
1.A.2.f Non-metallic minerals	6753.1	857.4	948.5	1045.0	1174.9	1170.9	−82.66%
1.A.2.g Transport equipment	12.7	0.8	0.8	0.8	0.8	0.4	−96.55%
1.A.2.h Machinery	1086.5	39.1	36.6	57.9	38.2	29.0	−97.33%
1.A.2.i Mining & quarrying	151.3	50.4	54.1	58.9	45.5	43.6	−71.18%
1.A.2.j Wood products	4.0	0.2	0.2	–	0.2	0.2	−95.00%
1.A.2.k Construction	423.0	318.1	300.6	394.6	435.6	416.5	−1.54%

Table . Manufacturing industries and construction (1.A.2), kt CO_2 eq

Emissions declined from 15,391.4 kt CO_2 eq in 1990 to 2,843.0 kt CO_2 eq in 2024 (81.53% below the base year). Compared with 2023, emissions decreased by 4.21%.

1.A.3 - Transport. There are all types of transport in Azerbaijan. The transport sector, like other sectors, began to develop after the development of the oil and gas industry. After Azerbaijan liberated its lands, this area began to develop more rapidly. At present, 3 new airports have been built or is being completed in the Karabakh and East Zangazur economic regions. All three of them can contribute to the implementation of international flights. In addition, a new shipyard, various off-road vehicle plants and transport auxiliary enterprises are being built in the country.

Indicators	1990	2020	2021	2022	2023	2024	1990-2024 difference, %
1.A.3 - Transport	6,091.53	6,932.53	7,777.90	9,241.62	9,974.51	10,765.84	**+76.73%**
1.A.3.a.ii - Domestic Aviation	462.06	411.82	296.43	473.1	587.87	663.63	**+43.62%**
1.A.3.b - Road Transportation	5,367.78	6,384.58	7,286.74	8,545.22	9,154.33	10,008.96	**+86.46%**
1.A.3.c - Railways	124.54	6.98	6.59	39.08	4.54	5.99	**−95.19%**
1.A.3.d.ii - Domestic Water-borne Navigation	100.76	124.16	183.53	179.69	222.79	81.14	**−19.47%**
1.A.3.e-Other Transportation	36.39	5.00	4.62	4.52	4.98	6.12	-83.24

Table 13. GHG emissions from transport, kt CO_2 eq.

Here, other types of transport are understood as transport moving in areas where there are no roads, performing special work. Among the types of transport, ground vehicles emit the largest GHG.

1.A.4 - Other sectors. The other sectors subcategory includes the following 3 directions:

1. Commercial / institutional;
2. Population;
3. Agriculture, forestry and fishing.

Data on GHG emitted into the atmosphere from this subcategory is presented in the table below.

Indicators	1990	2020	2021	2022	2023	2024	1990-2024 difference %
1.A.4 - Other Sectors	10,536.60	10,215.46	10,644.16	11,357.25	12,282.71	11,284.13	7.09
1.A.4.a - Commercial/ Institutional	1,582.79	510.64	431.80	1,169.04	2,211.01	1,055.95	33.29
1.A.4.b - Residential	5,642.80	8,360.51	8,850.87	8,867.85	8,779.99	8,901.35	57.75
1.A.4.c - Agriculture/Forestry/ Fishing/Fish Farms	3,311.01	1,344.31	1,361.48	1,320.35	1,291.70	1,326.84	-59.93
1.A.4.c.i - Stationary	2,947.23	1,285.37	1,310.01	1,304.47	1,277.69	1,301.87	-55.83
1.A.4.c.ii - Off-road Vehicles and Other Machinery	332.30	17.12	14.63	15.88	14.01	24.97	-92.48
1.A.4.c.iii - Fishing (mobile combustion)	31.48	41.82	36.84	NE	NE	NE	NA

Table 14. GHG emissions from other sectors subcategory, kt CO_2 eq.

As it seems from the table, most of the GHG emissions of the subcategory are below the reference year. In the population alone, emissions increased by about 57% from the reference year emissions. And this is due to the increase in demand for energy with the growth of the population and the improvement of their living conditions.

Fugitive emissions from fuels

1.B.2. – Oil and natural gas. This category arises mainly as a result of activities related to oil and natural gas. This includes exploration activities, extraction, processing, transportation, storage and distribution processes. As a result of all these processes, CO_2, N_2O and CH_4, which are the main GHG, are emitted into the atmosphere. This category is included in the list of key categories according to the level of emissions. CO_2 is emitted into the atmosphere as a result of the combustion process. And CO_2 that outbursts together with them during oil and gas production is called volatile emission.

There are three subcategories of the category:

1.B.2.a - Oil;

1.B.2.b - Natural gas;

1.B.2.c - Ventilation and flaring.

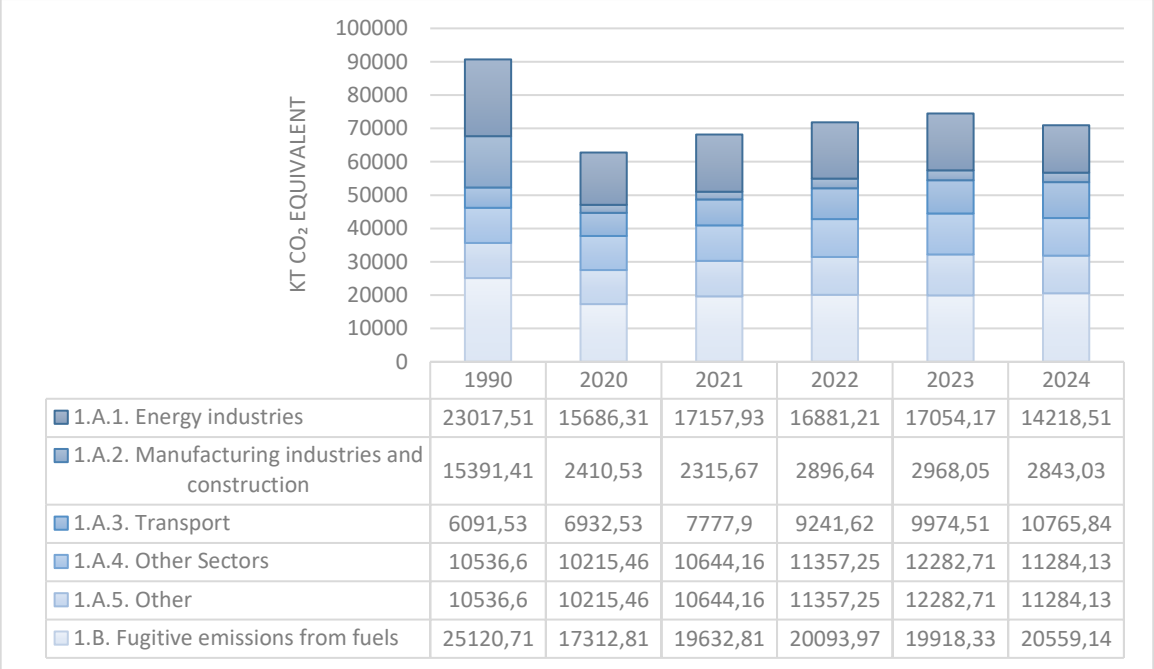
The amount of GHG emissions of the category is distributed over the time frame, unevenly, depending on the deposit. Therefore, the uncertainty of emissions of this category can reach up to 90%.

The emissions were calculated based on the Default emission factors in accordance with the IPCC (2006) methodology.

The updated inventory shows that fugitive emissions from oil and gas activities in 2024 were 18.16% below the 1990 level. CO_2 emitted into the atmosphere in the course oil production increased by up to 165%, while CH_4 in the course of gas production processes decreased by 38%. Due to the fact that the associated gas – methane, comes out together with the oil, and is burned by directing being directed to the flares CO_2 is obtained as a result of combustion. As a result, the decrease is due to the accumulation of the associated gas as much as possible.

Azerbaijan's Energy sector covers fuel combustion activities (1.A) and fugitive emissions (1.B). Since 1990, the country has seen a significant reduction in emissions, primarily due to the post-Soviet economic decline (see Figure 5).

2.1.1.2. RECENT TREND IN ENERGY SECTOR



	1990	2020	2021	2022	2023	2024
1.A.1. Energy industries	23017,51	15686,31	17157,93	16881,21	17054,17	14218,51
1.A.2. Manufacturing industries and construction	15391,41	2410,53	2315,67	2896,64	2968,05	2843,03
1.A.3. Transport	6091,53	6932,53	7777,9	9241,62	9974,51	10765,84
1.A.4. Other Sectors	10536,6	10215,46	10644,16	11357,25	12282,71	11284,13
1.A.5. Other	10536,6	10215,46	10644,16	11357,25	12282,71	11284,13
1.B. Fugitive emissions from fuels	25120,71	17312,81	19632,81	20093,97	19918,33	20559,14

Figure 5. Current Trend in Energy sector

- **1990:** 80,157.76 kt CO_2 eq.
- **2024:** 59,670.66 kt CO_2 eq.
- **Change:** Decrease of 25.56%

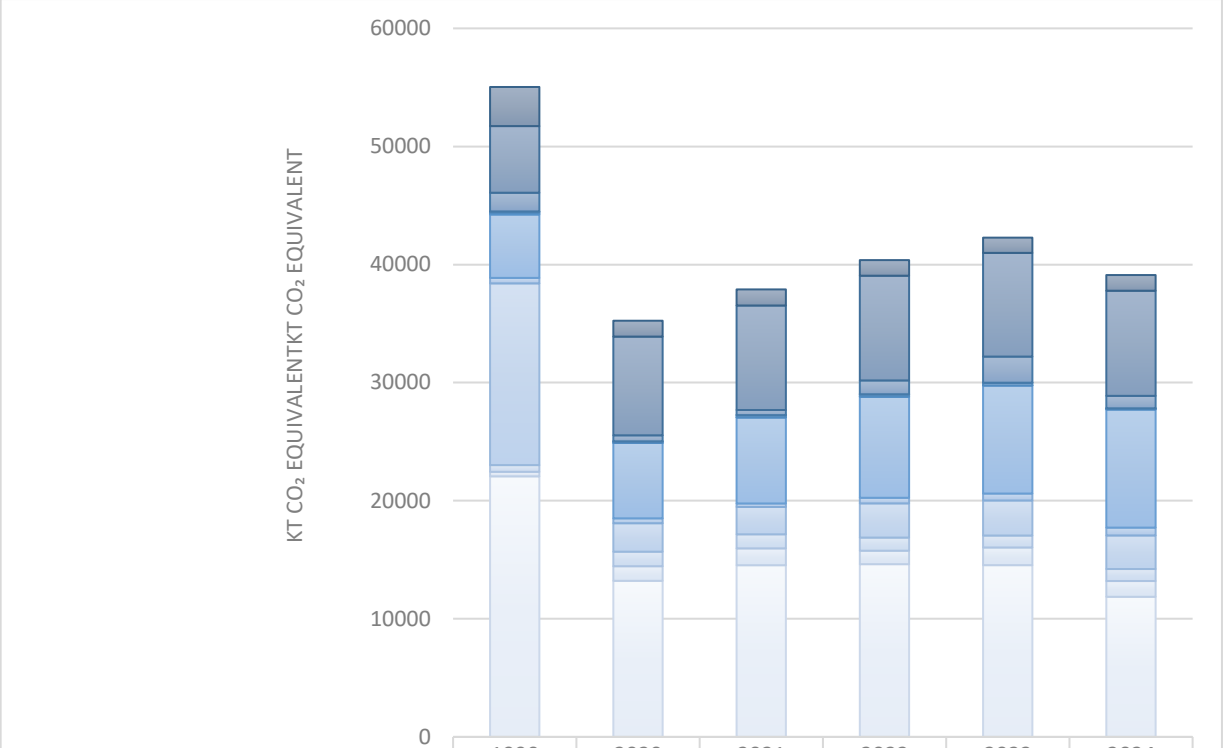
Trend: The reduction in emissions can primarily be attributed to the collapse of the Soviet Union in 1991, which led to a significant decline in energy production in Azerbaijan. The subsequent recovery of the economy, along with reforms in the energy sector, especially improvements in energy efficiency in energy production, played a key role. Investments in natural gas infrastructure also contributed, minimizing the share of fuel oil in the country's electricity production. During the reporting period, despite the increased demand for energy resources due to population growth, the widespread implementation of innovative technologies led to emission reductions in the sector.
Between 2020 and 2023, total Energy-sector emissions increased from 52,557.64 kt CO_2 eq to 62,197.76 kt CO_2 eq. This upward trend was reversed in 2024, when emissions decreased by 4.06% compared with 2023, reaching 59,670.66 kt CO_2 eq. Despite fluctuations in recent years, total Energy-sector emissions in 2024 remained 25.56% below the 1990 level, equivalent to approximately 74.44% of base-year emissions.

Fuel combustion activities (1.A) remained the largest component of Energy-sector emissions. Emissions from fuel combustion amounted to 55,037.05 kt CO_2 eq in 1990 and 39,111.52 kt CO_2 eq in 2024, representing a decrease of 28.94%. In 2024, fuel combustion accounted for approximately 65.54% of total Energy-sector emissions.

The decline in total Energy-sector emissions between 2023 and 2024 was driven primarily by reductions in Energy Industries (1.A.1), where emissions decreased by 16.63%, and Other Sectors (1.A.4), where emissions decreased by 8.13%. Manufacturing Industries and Construction (1.A.2) also decreased by 4.21%. By contrast emission in Transport (1.A.3) rose by 7.93%, and Fugitive Emissions from Fuels (1.B) increased by approximately 3.22%.

2.1.1.2.1 FUEL COMBUSTION ACTIVITIES (1.A):

In fuel combustion activities (1.A), emissions from energy industries, particularly from public electricity and heat production, have decreased as the economy moved away from the highly inefficient Soviet-era infrastructure. However, since the early 2000s, economic growth and high energy demand have led to a continuous increase in emissions, particularly in the transport and residential sectors.



	1990	2020	2021	2022	2023	2024
1.A.4.c. Agriculture/forestry/fishing	3311,01	1344,31	1361,48	1320,35	1291,7	1326,84
1.A.4.b. Residential	5642,8	8360,51	8850,87	8867,85	8779,99	8901,35
1.A.4.a. Commercial/institutional	1582,79	510,64	431,8	1169,04	2211,01	1055,95
1.A.3.e. Other transportation	36,39	5,00	4,62	4,52	4,98	6,12
1.A.3.d. Domestic navigation	100,76	124,16	183,53	179,69	222,79	81,14
1.A.3.c. Railways	124,54	6,98	6,59	39,08	4,54	5,99
1.A.3.b. Road transportation	5367,78	6384,58	7286,74	8545,22	9154,33	10008,96
1.A.3.a. Domestic aviation	462,06	411,82	296,43	473,1	587,87	663,63
1.A.2. Manufacturing industries and construction	15391,41	2410,53	2315,67	2896,64	2968,05	2843,03
1.A.1.c. Manufacture of solid fuels and other energy industries	567,36	1232	1192	1112	1011,6	1017,7
1.A.1.b. Petroleum refining	383,95	1236	1425	1140	1497,8	1334,5
1.A.1.a. Public electricity and heat production	22066,2	13218,31	14540,93	14629,21	14544,77	11866,31

Figure 6. GHG emissions from fuel combustion

- **1990:** 55,037 kt CO_2 eq.
- **2024:** 39,111.52kt CO_2 eq.
- **Change**: 28.94% reduction

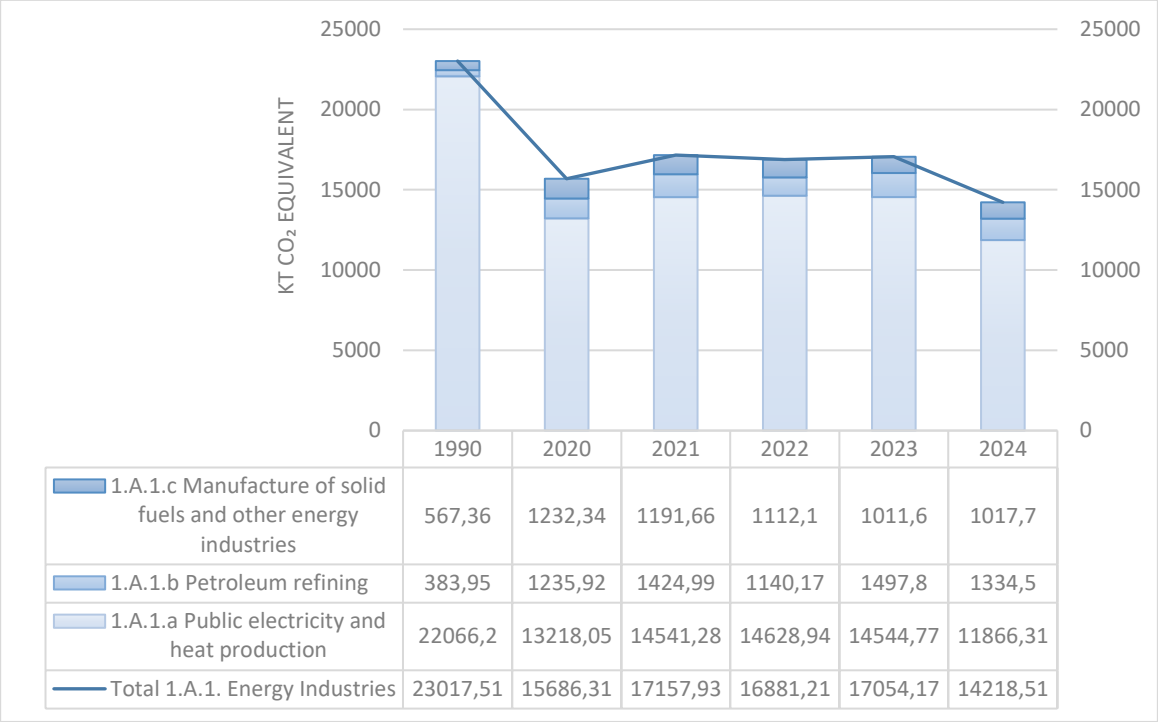
Trend: The reconstruction of industry and the modernization of industrial infrastructure during the post-Soviet period have contributed to the reduction of emissions from fuel combustion. Additionally, energy efficiency programs implemented by the Azerbaijani government, as well as efforts to reduce the carbon intensity of energy use in the industrial and commercial sectors, have led to a decrease in GHG emissions.

As seen in Figure 6, emissions from Fuel Combustion Activities (1.A) amounted to 55,037.05 kt CO_2 eq in the 1990 base year and decreased to 39,111.52 kt CO_2 eq in 2024, representing a reduction of 28.94%.

In the more recent period, total Fuel Combustion emissions increased from 35,244.83 kt CO_2 eq in 2020 to 42,279.43 kt CO_2 eq in 2023, an increase of approximately 19.96%. This trend reversed in 2024, when emissions decreased by 7.49% compared with 2023, reaching 39,111.52 kt CO_2 eq.

The reduction in 2024 was driven primarily by Energy Industries (1.A.1), where emissions decreased by 16.63% compared with 2023, together with decreases in Other Sectors (1.A.4) and Manufacturing Industries and Construction (1.A.2). By contrast the Transport emissions rose by 7.93% in 2024 compared with 2023.

2.1.1.2.1.1 Energy Industries (1.A.1)



	1990	2020	2021	2022	2023	2024
1.A.1.c Manufacture of solid fuels and other energy industries	567,36	1232,34	1191,66	1112,1	1011,6	1017,7
1.A.1.b Petroleum refining	383,95	1235,92	1424,99	1140,17	1497,8	1334,5
1.A.1.a Public electricity and heat production	22066,2	13218,05	14541,28	14628,94	14544,77	11866,31
Total 1.A.1. Energy Industries	23017,51	15686,31	17157,93	16881,21	17054,17	14218,51

Figure 7. GHG emissions from Energy Industries (1.A.1)

- **1990:** 23,017.51 kt CO_2 eq.
- **2024:** 14,218.51kt CO_2 eq**.**
- **Change:** Down by 38.23%.

Trend: GHG emissions from Energy Industries declined substantially over the inventory period, from 23,017.51 kt CO_2 eq in 1990 to 14,218.51 kt CO_2 eq in 2024, representing a reduction of 38.23%. The long-term trend reflects structural changes in Azerbaijan's energy system, modernization of energy infrastructure, changes in electricity and heat generation, and changes in fuel consumption patterns.

Public Electricity and Heat Production (1.A.1.a) remained the dominant source within Energy Industries. Emissions decreased from 22,066.20 kt CO_2 eq in 1990 to 11,866.31 kt CO_2 eq in 2024, corresponding to a reduction of approximately 46.22%.

The most significant change in the latest inventory year occurred within this category. Between 2023 and 2024, emissions from electricity generation decreased from approximately 10,675.8 to 8,411.8 kt CO_2 eq, a reduction of 21.2%. Emissions from combined heat and power generation also decreased, from approximately 3,412.3 to 2,974.5 kt CO_2 eq, or 12.8%. By contrast, emissions from heat plants increased moderately from approximately 456.7 to 480.0 kt CO_2 eq, an increase of 5.1%.

The decline in electricity-generation emissions is consistent with changes in the electricity-generation mix in 2024. Electricity production from hydro, wind and solar sources increased by approximately 90.3%, from 1,899.5 million kWh in 2023 to 3,615.6 million kWh in 2024, while generation from fuel-fired power plants decreased by approximately 9.1%.

Petroleum Refining (1.A.1.b) showed a different long-term pattern. Emissions increased from 383.95 kt CO_2 eq in 1990 to 1,334.50 kt CO_2 eq in 2024. In the latest year, however, emissions

decreased by approximately 10.90% compared with 2023, when they amounted to 1,497.80 kt CO_2 eq.

Emissions from Manufacture of Solid Fuels and Other Energy Industries (1.A.1.c) increased from 567.36 kt CO_2 eq in 1990 to 1,017.70 kt CO_2 eq in 2024. Between 2023 and 2024, emissions remained broadly stable, increasing by only approximately 0.60%.

Overall, Energy Industries emissions decreased from 17,054.17 kt CO_2 eq in 2023 to 14,218.51 kt CO_2 eq in 2024, corresponding to a reduction of 16.63%. The decrease was driven predominantly by lower emissions from electricity generation and combined heat and power production, reinforced by a reduction in petroleum-refining emissions.

2.1.1.2.1.1.1. Public Electricity and Heat Production (1.A.1.a)

Public Electricity and Heat Production (1.A.1.a) is the largest source of emissions within Energy Industries (1.A.1). The updated emission trend is presented below.

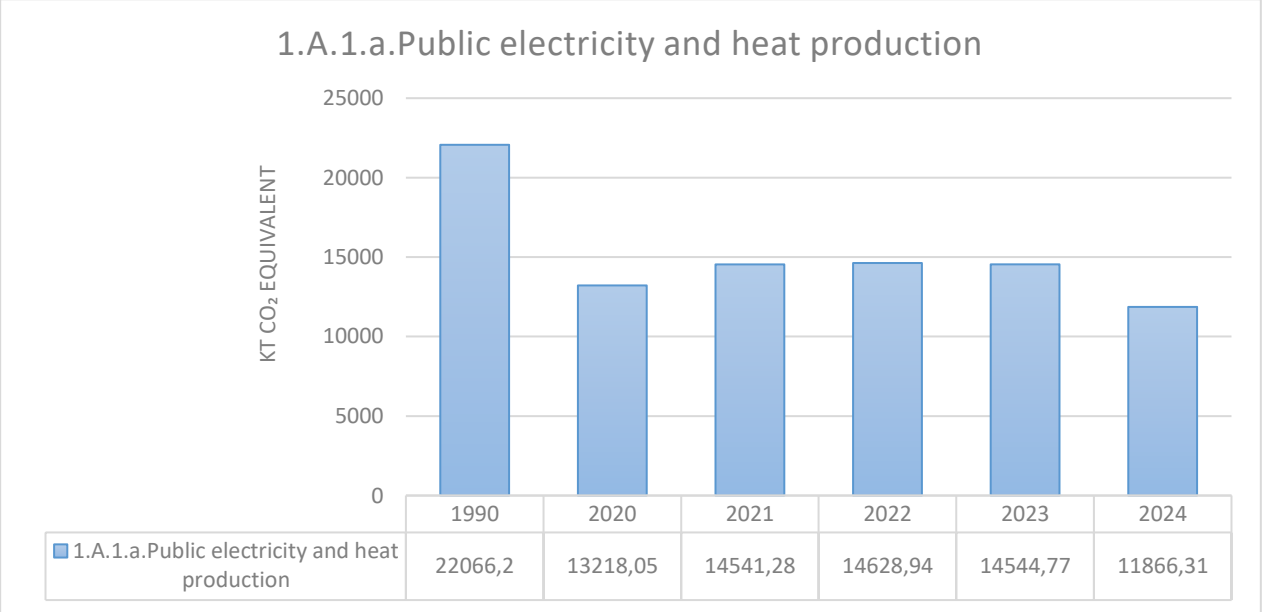


Figure 8. GHG emissions from the Public electricity and heat production

- **1990:** 22,066 kt CO_2 eq.
- **2024:** 11,866.31 kt CO_2 eq.
- **Change:** Decrease of 46.22%

Trend: GHG emissions from Public Electricity and Heat Production decreased substantially over the inventory period, from 22,066.20 kt CO_2 eq in 1990 to 11,866.31 kt CO_2 eq in 2024, representing a reduction of 46.22%. The long-term trend reflects major changes in Azerbaijan's electricity and heat generation system, including modernization of generation infrastructure, changes in the generation mix and improvements in the efficiency of energy production.

During the more recent period, emissions increased from 13,218.05 kt CO_2 eq in 2020 to 14,628.94 kt CO_2 eq in 2022, remained broadly stable in 2023 at 14,544.77 kt CO_2 eq, and then declined markedly to 11,866.31 kt CO_2 eq in 2024. This represents a year-on-year reduction of approximately 18.42%.

The largest decrease occurred in electricity generation (1.A.1.a.i), where emissions declined from approximately 10,675.8 kt CO_2 eq in 2023 to 8,411.8 kt CO_2 eq in 2024, or 21.2%. Emissions from combined heat and power generation (1.A.1.a.ii) also decreased from approximately 3,412.3 to 2,974.5 kt CO_2 eq, corresponding to a reduction of 12.8%. By contrast, emissions from heat plants (1.A.1.a.iii) increased moderately from approximately 456.7 to 480.0 kt CO_2 eq, or 5.1%.

The decline in emissions is consistent with significant changes in the electricity-generation mix in 2024. Official energy statistics show that generation from hydropower, wind and solar increased from approximately 1,893.2 million kWh in 2023 to 3,618.4 million kWh in 2024, an increase of

approximately 91.1%. At the same time, electricity generation from thermal power plants decreased from 27,160.4 million kWh to 24,543.2 million kWh, or by approximately 9.6%, while total electricity generation declined by approximately 3.0%.

These developments indicate that the decline in emissions was considerably larger than the reduction in total electricity output, suggesting a lower emissions intensity of electricity generation in 2024. Moreover, while national GDP increased by 4.1% compared with 2023, emissions from Public Electricity and Heat Production decreased by 18.42%. This divergence is consistent with a degree of partial decoupling of economic growth from emissions in this category, although longer-term analysis would be required to establish a sustained decoupling trend.

Public Electricity and Heat Production remained the dominant source within Energy Industries in 2024, accounting for approximately 83.46% of total emissions from category 1.A.1.

2.1.1.2.1.2. Manufacturing and construction (1.A.2)

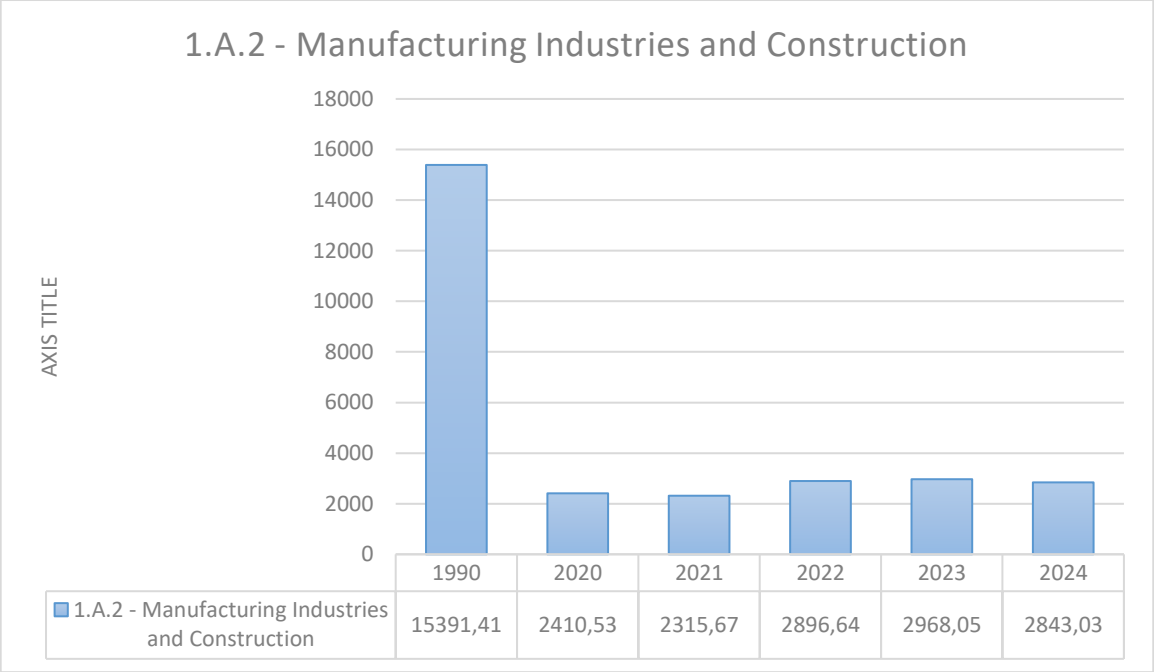


Figure 9. GHG emissions from the Manufacturing and construction

- **1990:** 15,391 kt CO_2 eq.
- **2024:** 2,843 kt CO_2 eq.
- **Change:** Drop of 81,5%.

Trend: The collapse of energy-intensive industries, particularly cement and steel production, during the Soviet era in the 1990s is reflected here. Many of these industries have not fully recovered, and the transition to a more service-oriented economy has further reduced energy demand in this sector.

This subcategory includes all manufacturing and construction sites. Following the collapse of the Soviet Union, activities in the manufacturing and construction sectors began to weaken starting in the 1990s. This was due to the disruption of economic ties among the countries that were part of the Soviet Union and the lack of competitive production facilities in the country. From the 2000s onwards, with the revival of the oil and gas industry, activities in this industrial sector also began to recover. New companies and enterprises started to emerge. These industries are now equipped with modern equipment and are competitive. Consequently, the amount of GHG emissions that are released into the atmosphere is low. This situation is visually represented in the following figure.

GHG emissions from Manufacturing Industries and Construction decreased substantially over the inventory period, from 15,391.41 kt CO_2 eq in 1990 to 2,843.03 kt CO_2 eq in 2024, representing a reduction of 81.53%.

The long-term trend reflects the substantial contraction and restructuring of industrial activity and energy demand following the dissolution of the Soviet Union, as well as subsequent modernization and changes in the structure and efficiency of fuel use. Although manufacturing and construction activity has recovered considerably in a number of subsectors since the 2000s, fuel-combustion emissions have remained well below the 1990 level.

In the more recent period, emissions increased from 2,315.67 kt CO_2 eq in 2021 to 2,968.05 kt CO_2 eq in 2023, before declining to 2,843.03 kt CO_2 eq in 2024. This corresponds to a year-on-year reduction of 4.21%.

The overall decrease in 2024 reflects differing trends across industrial subsectors. Fuel-combustion emissions from Iron and Steel increased substantially, from approximately 53.7 kt CO_2 eq in 2023 to 98.9 kt CO_2 eq in 2024, an increase of 84.2%. However by contrast, in several other categories emissions decreased by approximately 46.1% in Non-Ferrous Metals, 12.6% in Chemicals, 8.2% in Food Processing, Beverages and Tobacco, 24.1% in Machinery, 4.2% in Mining and Quarrying, and 4.4% in Construction.

Non-Metallic Minerals, which remains an important source within 1.A.2, was broadly stable, with emissions decreasing by only 0.3% between 2023 and 2024. Smaller increases were recorded in Textile and Leather (2.0%) and Other Industry (5.5%).

The recent subcategory trends broadly reflect changes in industrial activity and fuel consumption. For example, the increase in Iron and Steel fuel-combustion emissions occurred alongside higher production of selected steel products, whereas lower emissions from Non-Ferrous Metals and Chemicals were accompanied by declines in several relevant production indicators. However, these relationships will be investigated further since the emissions under 1.A.2 depend directly on the quantity and type of fuels combusted, rather than industrial output alone.

Overall, the 4.21% reduction in 2024 resulted from decreases across several manufacturing subsectors that outweighed the increase in Iron and Steel. Despite fluctuations in recent years and the recovery of industrial activity in several areas, emissions from Manufacturing Industries and Construction remained 81.53% below the 1990 base-year level.

2.1.1.2.1.3. Transport (1.A.3)

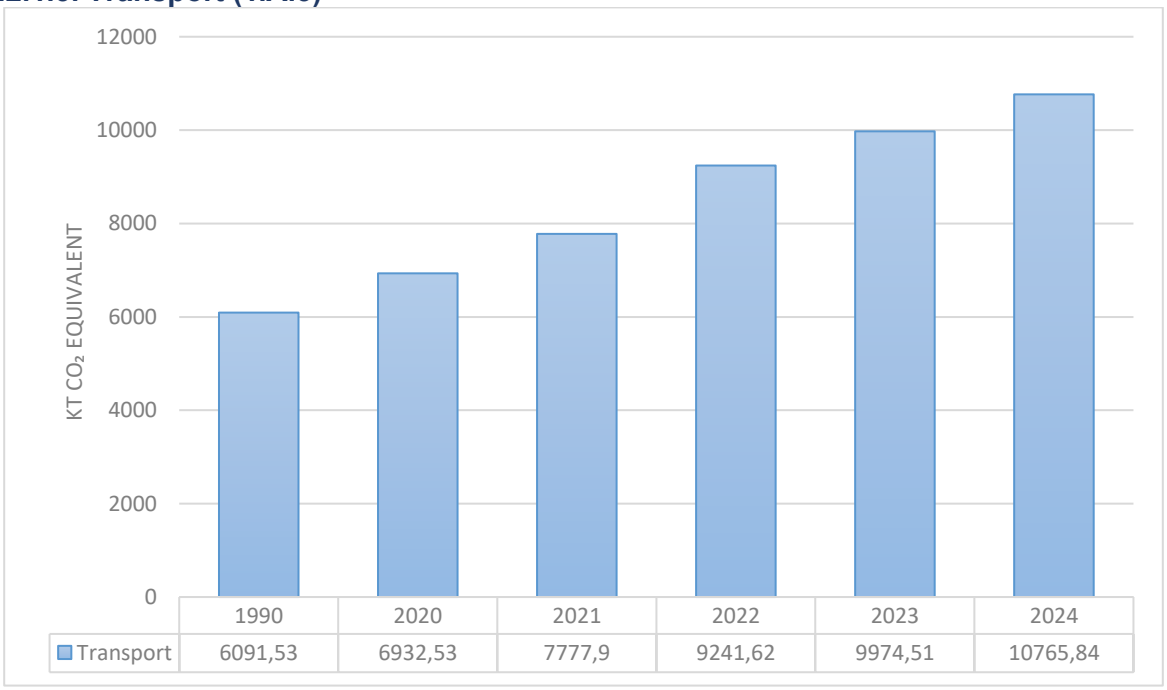


Figure 10. GHG emissions from the Transport category

- **1990:** 6,092 kt CO_2 eq.
- **2024:** 10,766kt CO_2 eq.
- **Change:** Increase of 76.73%

Trend: The increase in emissions in the transportation category is directly related to the growth in the country's population and income levels. The rise in income due to economic growth has led to a rapid increase in the use of cars and other means of transportation, consequently contributing to the rise in emissions.

The increase in emissions in the transportation category is directly related to the growth in the country's population and income levels. The rise in income due to economic growth has led to a rapid increase in the use of cars and other means of transportation, consequently contributing to the rise in emissions.

Transport emissions increased substantially over the inventory period, from 6,091.53 kt CO_2 eq in 1990 to 10,765.84 kt CO_2 eq in 2024, representing an increase of 76.73%. The recent trend has also been upward, with emissions increasing in each year from 2020 to 2024. Between 2023 and 2024, total Transport emissions increased by 7.93%.

Road Transportation (1.A.3.b) is the dominant source within the category. Emissions increased from 9,154.33 kt CO_2 eq in 2023 to 10,008.96 kt CO_2 eq in 2024, an increase of approximately 9.34%, and accounted for approximately 92.97% of total Transport emissions in 2024. The increase was driven mainly by passenger cars. Emissions associated with passenger cars increased by approximately 8.8%, alongside an increase in the number of passenger cars from 1,501,957 in 2023 to 1,585,265 in 2024, or approximately 5.5%.

Emissions from heavy-duty vehicles and buses also increased substantially in 2024, reflecting a marked increase in reported fuel consumption, including gaseous fuels. Given the relatively small absolute contribution of this subcategory compared with passenger cars, the overall increase in road-transport emissions continued to be driven predominantly by passenger-car fuel consumption.

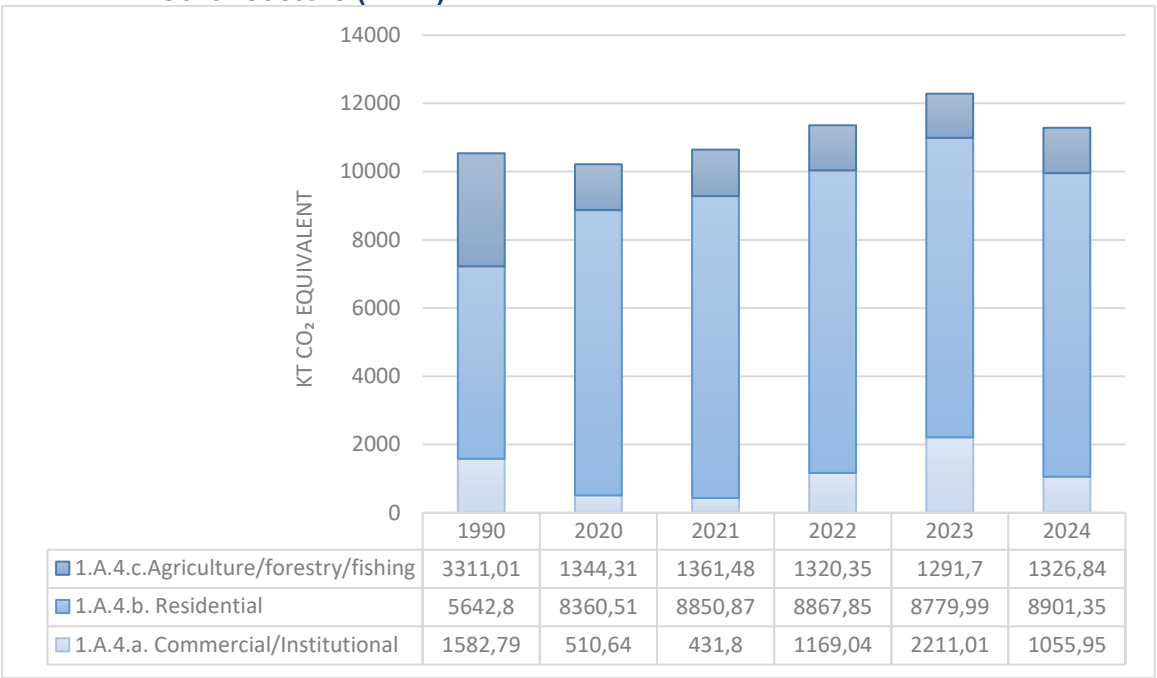
Domestic aviation emissions increased from 587.87 kt CO_2 eq in 2023 to 663.63 kt CO_2 eq in 2024, corresponding to an increase of approximately 12.89%. This increase is consistent with the rise in reported jet-fuel consumption for domestic aviation from approximately 8,159.9 TJ to 9,211.5 TJ.

The remaining transport categories made comparatively small contributions to the total. Railway emissions increased from 4.54 to 5.99 kt CO_2 eq, while Other Transportation increased from 4.98 to 6.12 kt CO_2 eq. In contrast, emissions from domestic water-borne navigation decreased substantially, from 222.79 kt CO_2 eq in 2023 to 81.14 kt CO_2 eq in 2024, a reduction of approximately 63.58%, reflecting lower reported fuel consumption in this activity.

Overall, the 7.93% increase in Transport emissions in 2024 was driven principally by Road Transportation and Domestic Aviation, despite the substantial reduction in domestic navigation.

Between 2023 and 2024, total Transport (1.A.3) emissions increased by 7.93%. Preliminary estimates for 2025 indicate a possible reversal of this trend in Road Transportation (1.A.3.b), with emissions decreasing from 10,008.96 kt CO_2 eq in 2024 to approximately 9,578.02 kt CO_2 eq in 2025, corresponding to a reduction of about 4.31%.

2.1.1.2.1.4. Other sectors (1.A.4)



	1990	2020	2021	2022	2023	2024
1.A.4.c.Agriculture/forestry/fishing	3311,01	1344,31	1361,48	1320,35	1291,7	1326,84
1.A.4.b. Residential	5642,8	8360,51	8850,87	8867,85	8779,99	8901,35
1.A.4.a. Commercial/Institutional	1582,79	510,64	431,8	1169,04	2211,01	1055,95

Figure 11. GHG emissions from the Other sectors

- **1990**: 10,536.6 kt CO_2 eq.
- **2024**: 11,284.13kt CO_2 eq.
- **Change**: Increase of 7.09%.

Trend: Total GHG emissions from Other Sectors increased moderately over the inventory period, from 10,536.60 kt CO_2 eq in 1990 to 11,284.13 kt CO_2 eq in 2024, corresponding to an increase of 7.09%. The overall trend reflects substantially different developments across the Commercial/Institutional, Residential, and Agriculture/Forestry/Fishing subcategories.

Emissions from Commercial/Institutional activities decreased from 1,582.79 kt CO_2 eq in 1990 to 1,055.95 kt CO_2 eq in 2024, representing a reduction of 33.29%. The recent time series shows considerable year-to-year variation. Emissions increased from 431.80 kt CO_2 eq in 2021 to 2,211.01 kt CO_2 eq in 2023, before decreasing sharply by 52.24% to 1,055.95 kt CO_2 eq in 2024. The decline in the latest year primarily reflects substantially lower reported fuel consumption, particularly natural gas consumption, in commercial and institutional activities.

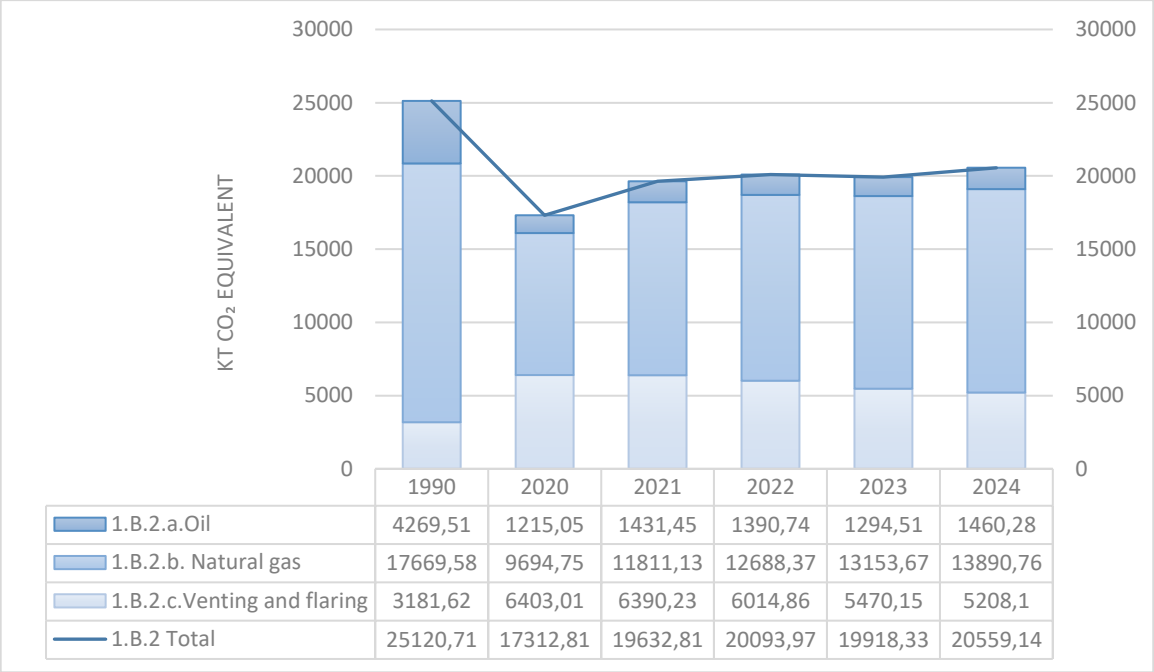
The Residential sector remained the largest source within Other Sectors. Emissions increased from 5,642.80 kt CO_2 eq in 1990 to 8,901.35 kt CO_2 eq in 2024, corresponding to an increase of 57.75%. This long-term increase reflects higher household energy demand over the inventory period, associated with residential heating, hot-water supply and cooking. In 2024, residential emissions increased slightly by 1.38% compared with 2023.

Emissions from Agriculture/Forestry/Fishing fuel-combustion activities decreased substantially over the longer term, from 3,311.01 kt CO_2 eq in 1990 to 1,326.84 kt CO_2 eq in 2024, representing a reduction of 59.93%. In the latest inventory year, emissions increased moderately by 2.72% compared with 2023, reflecting higher reported fuel consumption in these activities.

Overall, emissions from Other Sectors reached 12,282.71 kt CO_2 eq in 2023 before decreasing by 8.13% to 11,284.13 kt CO_2 eq in 2024. This reduction was driven almost entirely by the sharp decline in Commercial/Institutional emissions, which more than offset the modest increases recorded in the Residential and Agriculture/Forestry/Fishing subcategories.

2.1.1.2.2. FUGITIVE EMISSIONS FROM FUELS (1.B)

Fugitive emissions from oil and gas production (1.B) remain high. Although some reductions have been achieved in recent years due to improved management practices and technological advancements, the oil and gas sector continues to dominate emissions within the country.



	1990	2020	2021	2022	2023	2024
1.B.2.a.Oil	4269,51	1215,05	1431,45	1390,74	1294,51	1460,28
1.B.2.b. Natural gas	17669,58	9694,75	11811,13	12688,37	13153,67	13890,76
1.B.2.c.Venting and flaring	3181,62	6403,01	6390,23	6014,86	5470,15	5208,1
1.B.2 Total	25120,71	17312,81	19632,81	20093,97	19918,33	20559,14

Figure 12. Fugitive emissions from Oil and Gas Production

- **1990:** 25,121 kt CO_2 eq.
- **2024:** 20,559 kt CO_2 eq.
- **Change:** Decrease of 18.2%.

Trend: Fugitive emissions from Azerbaijan's oil and natural gas systems remain an important component of the national GHG emissions profile, reflecting the scale of hydrocarbon production, processing, transmission, storage and distribution activities. Nevertheless, total Fugitive Emissions from Fuels (1.B) decreased from 25,120.71 kt CO_2 eq in 1990 to 20,559.14 kt CO_2 eq in 2024, representing an overall reduction of 18.2%.

Between 2023 and 2024, total fugitive emissions increased by 3.22%, mainly due to higher emissions associated with natural gas production. Natural gas-system emissions increased by 5.6%, with emissions from the production stage increasing by approximately 6.0%. In contrast, oil-system emissions decreased by approximately 1.4%, including reductions of 3.6% in venting and 4.9% in flaring.

These developments occurred alongside strengthened methane-management and decarbonization measures in the oil and gas sector. SOCAR reports the implementation and expansion of leak detection and repair (LDAR) programmes, including a project that avoided approximately 26,340 t CO_2 eq of emissions, as well as the deployment of infrared leak-detection technologies, enhanced methane monitoring and measures to reduce venting and flaring. SOCAR has also joined the Oil and Gas Methane Partnership 2.0 (OGMP 2.0). In 2024, UNEP's International Methane Emissions Observatory independently documented methane emissions at the Neft Daşları complex and subsequently confirmed through satellite observations that the detected emissions were no longer observed following the installation of infrastructure to recover associated gas previously vented to the atmosphere. These initiatives provide relevant operational context for the observed reductions in selected fugitive-emission sources and demonstrate ongoing efforts to strengthen methane monitoring and emissions management.

CH_4 remains the dominant greenhouse gas within the fugitive-emissions category because methane can be released directly during oil and natural gas production, processing, transmission, storage and distribution, including through venting and unintended leakage. CO_2 emissions arise mainly from flaring.

2.1.1.2.3 INTERNATIONAL BUNKERS

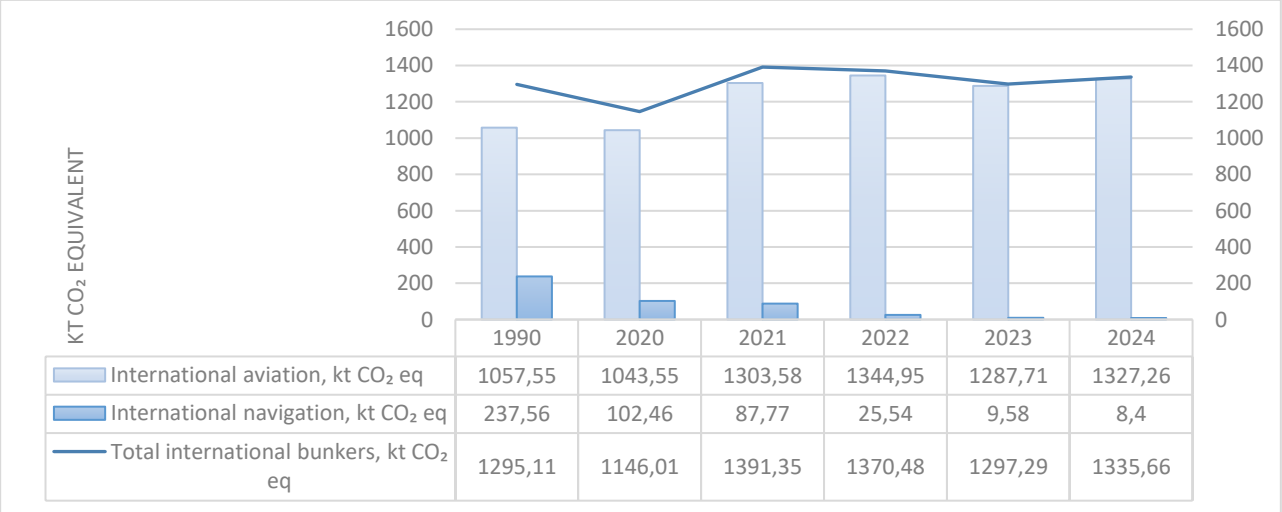
International bunkers comprise emissions from two categories of international transport: 1.A.3.a.i – International Aviation;

1.A.3.d.i – International water-borne navigation.

In accordance with the 2006 IPCC Guidelines and the ETF reporting framework, emissions from international aviation and international navigation are estimated and reported separately as memo items and are not included in national GHG emission totals. This treatment ensures consistency with the applicable international inventory reporting approach.

Emissions from international bunkers are estimated on the basis of fuel supplied for international transport activities. For international aviation, the principal fuel is jet kerosene, while marine bunker fuels are reported according to the fuel types recorded in the national energy balance. The corresponding CO_2, CH_4 and N_2O emissions are estimated using the applicable IPCC methodologies and emission factors.

For BTR2, the international bunker time series has been updated through 2024. The resulting emissions, expressed in CO_2 equivalent using AR5 global warming potentials, are presented below.



	1990	2020	2021	2022	2023	2024
International aviation, kt CO_2 eq	1057,55	1043,55	1303,58	1344,95	1287,71	1327,26
International navigation, kt CO_2 eq	237,56	102,46	87,77	25,54	9,58	8,4
Total international bunkers, kt CO_2 eq	1295,11	1146,01	1391,35	1370,48	1297,29	1335,66

Figure 13. GHG emissions from International Bunkers

- 1990: 1,295.11 kt CO_2 eq
- 2024: 1,335.66 kt CO_2 eq
- Change: Increase of 3.13%

The updated time series shows that emissions from international bunkers have fluctuated over the reporting period rather than followed a continuous upward trend. Total emissions decreased to 1,146.01 kt CO_2 eq in 2020, subsequently increased to 1,391.35 kt CO_2 eq in 2021, and remained at 1,370.48 kt CO_2 eq in 2022. Emissions then decreased to 1,297.29 kt CO_2 eq in 2023 before increasing by approximately 2.96% to 1,335.66 kt CO_2 eq in 2024.

International aviation is the dominant component of international bunker emissions. Aviation emissions increased from 1,057.55 kt CO_2 eq in 1990 to 1,327.26 kt CO_2 eq in 2024, an increase of approximately 25.50%. By contrast, emissions from international navigation decreased substantially from 237.56 kt CO_2 eq in 1990 to 8.40 kt CO_2 eq in 2024. Consequently, international aviation accounted for approximately 99.37% of total international bunker emissions in 2024.

Overall, total international bunker emissions in 2024 were only 3.13% above the 1990 level and remained 2.54% below the 2022 level. Future trends will depend mainly on international aviation activity, international navigation activity and the quantities and types of bunker fuels supplied.

2.1.2. Industrial Processes and Product Use (IPPU)

2.1.2.1. HISTORICAL TREND IN IPPU

"Industrial processes and product use" is the second sector of the IPCC methodology. The report considered 6 important categories of the sector. GHG emissions in this sector arise mainly from the technological processes of industrial plants and factories, as well as from the use of certain products. The main sources of emissions are mineral production (particularly cement and lime production), the chemical industry and metallurgy (including steelmaking and aluminium production).

Today, industry is one of the main directions of economic policy in most countries. At present, most of the workforce in the world is concentrated in industries. Recently, the share of developing countries in the global industrial production has increased. Thus, the share of these countries in the global industrial production has increased by 2 times and reached 40% as compared to 2000.

As in the most countries of the world, industrialization is one of the priorities of economic policy in developing Azerbaijan. The first industrial oil production in the world in Baku in 1848 is considered the beginning of industrialization in Azerbaijan. The world's first refinery and oil tanker were put into operation in Azerbaijan. After that, enterprises of various profiles, which produced the equipment necessary for the oil industry, began to be established. During the industrialization period of 1945-1969, major industrial cities such as Mingachevir and Sumgayit were established in the country. Later Sumgayit became a city of chemists. Enterprises for ore refining in Dashkasan, for aluminum production in Ganja and Sumgayit, for cement production in Garadagh were put into operation.

In the 70-80s of the last century, large-scale funds were directed to the development of industry, a number of large industrial enterprises were created, industry diversification accelerated, and its structure improved. In the early 1980s, 100% of domestic air conditioners and deep-well working barrels, 70% of oil-field equipment, 1/3 of wine products, 10% of electric-welding equipment, 6% of refrigerators were produced in Azerbaijan in the former USSR. During this period, the largest steel-making plant in the South Caucasus, Baku domestic air conditioners, electronics production in Ganja, Sumgayit domestic compressors, plants specializing in the production of Integral microcircuits, and the largest Baku Deep Water Jacket Factory began to operate in Baku.

As a result of all the measures taken in 1969-1982, industrial production in Azerbaijan increased by 2.7 times, and this growth was achieved due to non-oil sectors. In the early 1980s, the share of petrochemical, chemical, metallurgical, mechanical engineering, instrument-making, electronics, furniture production, light and food industries in the structure of industry increased to 75%.

The political events that took place since 1985 and the crisis that began with the occupation of 20% of the country's territory by Armenia had a negative impact on all sectors of the economy. As a result, the volume and range of industrial production had sharply decreased till 1995.

Starting from 1997, the restoration of political and economic stability in the country breathed new life into the development of industrial production. Since 2003, rapid industrial growth has been observed in Azerbaijan, purposeful measures have been taken to resolve energy supply issues vital for industrial production. As a result of the works done, the industry has entered a new stage of development.

In order to ensure the sustainable development of the non-oil sector in Azerbaijan, attract foreign investments to the country, organize new competitive production and service areas and increase the employment of the population, “State program on the development of industry in the Republic of Azerbaijan for 2015-2020” was approved by the Order of the President of the Republic of Azerbaijan dated December 26, 2014. The main goal of the State Program was the following:

- Modernization of the industry and improvement of its structure;
- Increase of export potential of non-oil industry;
- Expansion of competitive industrial production that uses energy efficiently, generates high added value;
- Expansion of knowledge-intensive and innovative production;
- Training of qualified personnel for new production areas.

During the implementation of the State Program, the focus was on the strengthening the activities of existing industrial and technology parks, creating new industrial parks, launching special economic zones and increasing the industrial potential of the regions. So, during the implementation of the program, six industrial parks were created, hundreds of industrial enterprises of various purposes were built and commissioned and thousands of new jobs were created within the framework of other state programs.

The establishment of industrial districts in the country was determined by the Decree of the President of the Republic of Azerbaijan “On the establishment and organization of industrial districts” dated October 8, 2014. Industrial districts is of great importance in terms of reducing infrastructure costs in organizing the production process, strengthening cooperative relations, developing small and medium-sized businesses, and resolving other issues.

In addition, “Strategic roadmap for the development of heavy industry and mechanical engineering in the Republic of Azerbaijan” was approved by the Decree of the Head of State dated on December 6, 2016.

An analysis of the main geographical aspects of Azerbaijan's socio-economic development shows that potential GHG emissions are generated in Baku and its surrounding Absheron district. Cement plants of the country play an important role among enterprises that increase GHG emissions in the industrial sector.

In addition, the country has a large ethylene-polyethylene plant, enterprises for the production of various equipment for the energy sector, power engineering, chemical, metallurgical, new methanol and carbamide plants, construction, light and food industries enterprises.

In 2015, technical equipment plant of “Azertechnoline” LLC was established in "Sumgayit Chemical Industrial Park" established in Absheron district. After that, in 2018, “SOCAR Polymer” LLC's polypropylene production, Ferroalloy plants, tobacco products factory and Construction Chemicals plant started operating in the park. In 2019, carbamide and high-density polyethylene production plants of “SOCAR Polymer” LLC were commissioned.

The expansion of industrial parks and districts, the modernisation of mineral-production facilities and the development of the metallurgical and chemical industries have influenced the level and structure of GHG emissions in the IPPU sector. This is reflected in the updated emission estimates covering the period 1990–2024 (Figure 14).

According to the latest estimates, total reported IPPU emissions increased from 1,246.435 Gg CO_2-eq in 1990 to 4,581.031 Gg CO_2-eq in 2024. However, emissions from category 2.F (Product uses as substitutes for ODS) were not occurring for 1990, whereas estimates for this category are included from 2020 onwards. Excluding category 2.F from the 2024 total, emissions from the categories quantified in both years amounted to 3,997.065 Gg CO_2-eq in 2024, compared with 1,246.435 Gg CO_2-eq in 1990.

At category level, emissions from mineral production increased from 410.549 Gg CO_2-eq in 1990 to 2,450.252 Gg CO_2-eq in 2024, while emissions from the chemical industry increased from 194.731 to 681.441 Gg CO_2-eq. Emissions from metal production increased from 613.326 to 823.745 Gg CO_2-eq, and emissions from lubricant use rose from 27.829 to 41.626 Gg CO_2. Emissions from category 2.F amounted to 583.966 Gg CO_2-eq in 2024, but no corresponding estimate is available for 1990.

Between 2023 and 2024, total IPPU emissions increased by approximately 10.7%, from 4,137.718 to 4,581.031 Gg CO_2-eq. This change reflected increases in emissions from mineral production, metal production, lubricant use and product uses as substitutes for ODS. By contrast a decrease in emissions from the chemical industry is observed.

Emissions in all categories have increased compared to the 1990 reference year. Based on the latest estimates, emissions from mineral production in 2024 were approximately 6.0 times their 1990 level, while emissions from the chemical industry were approximately 3.5 times higher. Emissions from metal production increased by approximately 34.3%, and emissions from lubricant use increased by approximately 49.6%. Category 2.F is not included in this comparison because emissions for 1990 were not occurring.

2A. Mineral Industry. Cement production accounts for the largest GHG emissions in the sector's mineral production category. In the reference 1990, one cement plant was operating in Azerbaijan, while now the number of enterprises has reached four, each of which produces more than a million ton of cement per year.

The first cement plant in the country was founded in 1950. The same Garadagh cement plant, which weakened its activity, was privatized by the Swiss “Holcim” company in 1999. The company called "Holcim-Azerbaijan" was put into operation in 2012. The plant marked the beginning of a new era in the cement industry of the South Caucasus region. At this enterprise, which meets the most modern requirements, equipment from the USA, Germany, Italy, Switzerland and other developed countries was installed, four furnaces operating with the old wet method were replaced by one oven operating with the dry method. The annual production capacity of the plant is 1.7 million ton.

"Norm" cement plant has been operating in Garadagh district of Baku since 2014. The plant is the largest enterprise engaged in the production of cement not only in Azerbaijan, but in the South Caucasus as a whole. The annual production capacity is 2 million tons.

The expansion of construction works in connection with the population growth, emergence of new enterprises increased the demand for cement and lime materials. Therefore, the emission of carbon dioxide into the atmosphere has also increased.

According to the latest estimates, CO_2 emissions from cement production amounted to 2,421.888 Gg in 2024, approximately 6.0 times the 1990 estimate of 401.399 Gg. Emissions from lime production reached 27.811 Gg CO_2 in 2024, compared with 3.300 Gg in 1990, representing an increase of approximately 8.4 times. In glass production, estimated emissions decreased from 5.854 Gg CO_2 in 1990 to 0.554 Gg in 2024, a reduction of approximately 90.5%. The 1990 glass-production activity data were adopted on the basis of expert judgement, taking into account the substantially higher scale of industrial production during that period.

At the level of the mineral industry category as a whole, emissions increased from 2,124.806 Gg CO_2-eq in 2023 to 2,450.252 Gg CO_2-eq in 2024, mainly reflecting the increase in clinker production and the associated emissions from cement manufacturing.**2B. Chemical industry.** The enterprises responsible for GHG emissions in this field are currently methanol and ethylene-polyethylene plants. During the Soviet period there was a large petrochemical complex in Azerbaijan. Thus, a large energy-intensive Surfactants plant, a superphosphate plant, a synthetic rubber plant, an Orgsynthesis plant, a synthetic detergents plant and other small subsidiary enterprises were concentrated in Sumgayit, called the city of chemists. At that time, the city was ranked 1st in the country in terms of atmospheric pollution. At present, most of the above-mentioned enterprises have been closed, the rest have been reconstructed on the basis of modern technologies. Now these enterprises are replaced with the plants operating with new technology. There is an ethylene-polyethylene plant in Sumgayit and a methanol plant in Baku referred to the largest chemical industry. The methanol plant was built in 2014 and started its production activity in 2016. Data on GHG emissions of these plants is provided in the following table.

The latest inventory estimates show that total emissions from the chemical industry increased from 194.731 Gg CO_2-eq in 1990 to 681.441 Gg CO_2-eq in 2024. In recent years, emissions have reflected changes in the production volumes of methanol and ethylene. Between 2023 and 2024, total emissions from this category decreased by approximately 9.1%, primarily due to a reduction in ethylene production, partly offset by an increase in methanol production.

Years	Methanol production		Ethylene production	
	CO_2	CH_4	CO_2	CH_4
1990	NO	NO	187.72	0.25
2020	319.32	1.10	229.62	0.31
2021	253.33	0.87	378.73	0.51
2022	358.12	1.23	314.41	0.42

2023	331.38	1.14	372.43	0.50
2024	346.06	1.19	291.25	0.39

Table 15. GHG emissions from Methanol and Ethylene production, kt of respective gas.

Note: CO_2 and CH_4 are presented separately in their respective gas masses. CH_4 emissions are included in the category total after conversion to CO_2-equivalent using the applicable global warming potential.

The history of the chemical industry in our country dates back to 1945, when the first chemical enterprise – the enterprise called “Ozer” and later known as the Sumgayit surfactant plant. After that, in 1950, Sumgayit Synthetic Rubber Plant was built and put into operation, and in 1980-83, the first in the South Caucasus superphosphate plant. In the 70-80s of the last century, the construction of “EP-300” installation began, which was commissioned in 1989. With the launch of the new technological complex, production of such valuable chemical products as ethylene, propylene, butylene-butadiene fraction, light and heavy pyrolysis resin, propane has begun. The main raw materials of this complex are hydrocarbon products of the Oil Refinery plant named after Haydar Aliyev.

In 2024, methanol production increased by 4.4%, from 494,600 tonnes in 2023 to 516,500 tonnes, while ethylene production decreased by 21.8%, from 165,600 to 129,500 tonnes. This change in production volumes was reflected in the estimated emissions from the two processes.

2C. Metal industry. This industrial field is one of the key categories of the “Industrial processes and use of products” sector that generates GHG emissions. This area is existed in the country since the beginning of the last century. In connection with the development of oil and gas industry, the metallurgical field also began to expand.

The metallurgical industry includes the extraction and use of metals, semimetals and non-metals from the earth, ores, salts. In the CRT structure, the metal industry comprises seven subcategories. The activities currently quantified in Azerbaijan are iron and steel production (2.C.1), ferroalloy production (2.C.2) and aluminium production (2.C.3).

According to the latest estimates, total emissions from metal production amounted to 650.132 Gg CO_2-eq in 2023 and increased to 823.745 Gg CO_2-eq in 2024, representing an increase of approximately 26.7%. This change was mainly associated with the increase in estimated emissions from aluminium production, while emissions from steel production also increased. Ferroalloy emissions for 1990 and 2024 are reported as NO due to the absence of a corresponding production value in the available statistics.

2C1. In the **production of iron and steel**, GHG sources are smelting furnaces. There are two largest metallurgical plants in Azerbaijan: “Baku Steel Company” and “Baku Steelmaking” OJSC. These enterprises and other small objects use mainly metal scrap waste as raw materials. "Baku Steel Company" is a new enterprise and is equipped with the most modern furnaces. Besides these, there are small enterprises that also produce various metallurgical products.

Steel production amounted to 352,500 tonnes in 2024, compared with 323,600 tonnes in 2023, representing an increase of 8.9%. Estimated CO_2 emissions from iron and steel production consequently increased from 472.456 Gg in 2023 to 514.650 Gg in 2024, or approximately 8.93%. This increase occurred alongside growth in metallurgical activity and the output of metal products in Azerbaijan. Demand from construction, infrastructure projects and other industrial activities may have contributed to this development.

2C2. Ferroalloy production. Ferroalloy production is another activity covered under the metal-industry category. National statistics report production of 15,368.7 tonnes in 2020, 13,915.4 tonnes in 2021, 13,270.5 tonnes in 2022 and 2,464.5 tonnes in 2023. The available SSC statistics do not provide a production value for 1990 and 2024.

2C3. **Aluminum production** began back in the 1950s. The Ganja aluminum plant, commissioned in 1966, produced aluminum oxide from alunite obtained from Dashkasan Zaylik deposits in 1966-1997. Over the specified period, 2.1 million tons of aluminum oxide, 4.5 million tons of sulfuric acid and 0.8 million tons of fertilizer were produced from 18.4 million tons of alunite ore.

Primary aluminium production generates CO_2 emissions through the consumption of carbon anodes during the electrolytic reduction of alumina. PFC emissions, particularly CF_4 and C_2F_6, are also generated during anode effects in aluminium electrolysis cells. The current inventory includes explicit estimates of these PFC emissions, representing an improvement in the completeness of the category compared with BTR1.

In 2024, total estimated emissions from aluminium production amounted to 309.096 Gg CO_2-eq, of which PFC emissions accounted for 203.782 Gg CO_2-eq, or approximately 65.9%. Total emissions from this category increased by 79.01% compared with 2023, reflecting the increase in the activity-data volume used in the current calculation from 36,769.8 to 65,821.0 tonnes.

CO_2 gases are emitted into the atmosphere from steelmaking production and aluminum production. Emissions of gases over the years are given in the figure 17.

2D Lubricant use is another category within the sector. Information on the amount of CO_2 emissions released into the atmosphere from its use is shown in Figure 18 (Non-Energy Products from Fuel and Solvent Use (2.D)).

According to the latest estimates, CO_2 emissions from lubricant use increased from 27.829 Gg in 1990 to 41.626 Gg in 2024, representing an increase of approximately 49.6%. In 2024, emissions increased by 17.9% compared with 2023, corresponding to an increase in lubricant consumption from 2,408.00 to 2,838.12 TJ.

2F category. Category 2.F covers emissions of fluorinated greenhouse gases (F-gases) used as substitutes for ozone-depleting substances (ODS). The main applications include refrigeration and air conditioning, foam blowing agents and fire protection.

In BTR1, emissions from refrigeration and air conditioning were not estimated due to limitations in the availability and disaggregation of national activity data. For BTR2, the activity-data basis was substantially strengthened through the compilation of Customs information on individual HFCs and commercial refrigerant blends imported in bulk for the period 2011–2024. This enabled the estimation of emissions primarily from refrigeration and stationary air conditioning (2.F.1.a), as well as from HFC-227ea used in fire-protection applications (2.F.3).

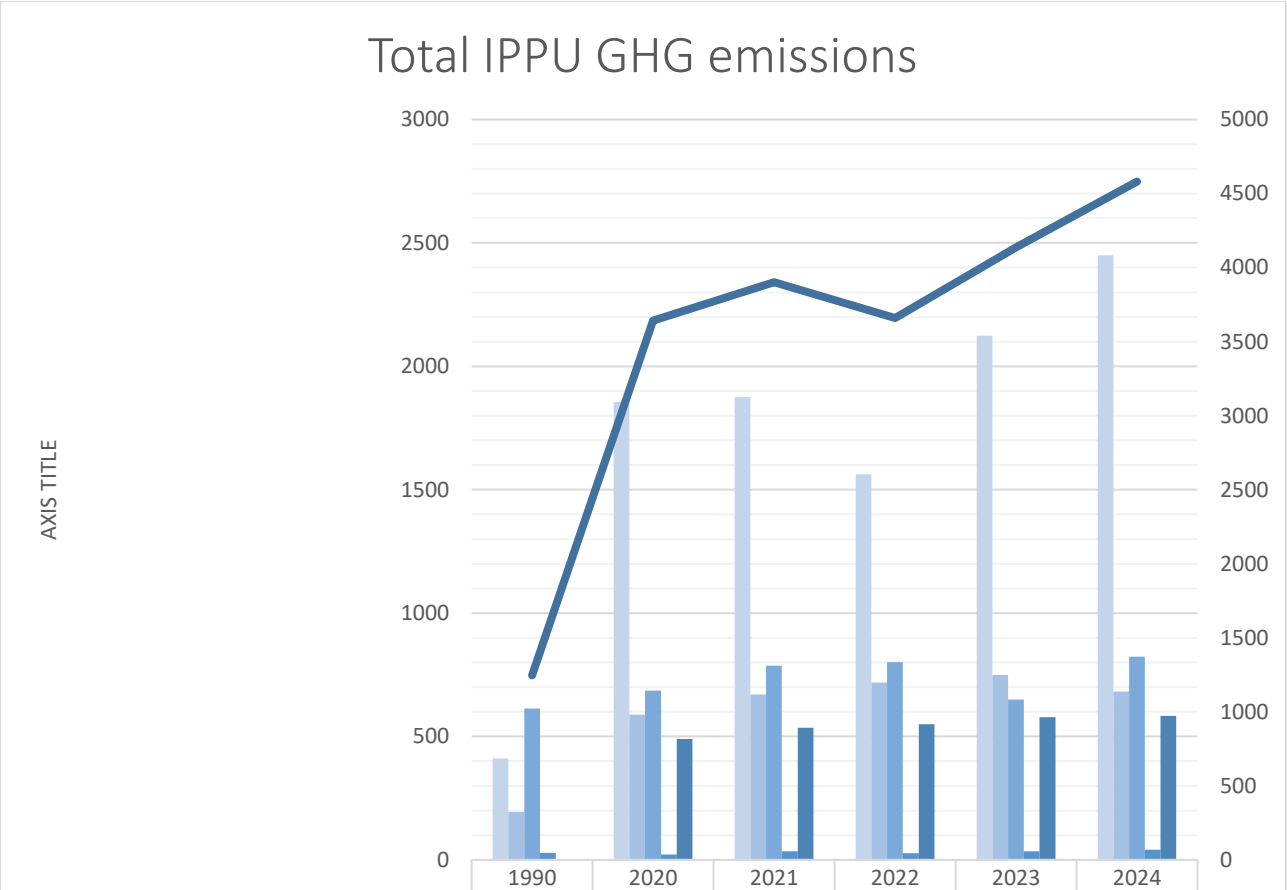
Total emissions from category 2.F amounted to 490.473 Gg CO_2-eq in 2020, 535.274 Gg in 2021, 549.436 Gg in 2022, 577.883 Gg in 2023 and 583.966 Gg in 2024. The majority of these emissions are associated with refrigeration and stationary air conditioning. Bulk imports are treated as activity data and are not considered equivalent to emissions in the year of import, as refrigerants may remain contained in equipment and form part of the refrigerant bank, with emissions occurring over time.

Emissions associated with fluorinated gases contained in imported equipment and products, as well as certain other applications, are reported as NE (Not Estimated) because consistent historical activity data are not yet available.

Azerbaijan ratified the Kigali Amendment to the Montreal Protocol on 24 November 2025, and the Amendment entered into force for the country on 22 February 2026. The Amendment establishes a phasedown schedule for HFC consumption. Its implementation, together with improved national data collection and coordination among the responsible institutions, is expected to strengthen the completeness and accuracy of future F-gas inventory estimates.

2.1.2.2. RECENT TREND IN IPPU SECTOR

In previous inventory submissions, the assessment of category 2.F (Product Uses as Substitutes for Ozone-Depleting Substances) was not carried out due to limitations in the availability of national activity data. According to the information available for 1990, no domestic production or imports of the relevant fluorinated-gas substitutes were identified for that year.



	1990	2020	2021	2022	2023	2024
2.A Mineral Industry	410,549	1855,589	1875,025	1562,641	2124,806	2450,252
2.B Chemical Industry	194,731	588,214	670,554	718,69	749,579	681,441
2.C Metal Industry	613,326	685,844	787,19	801,77	650,132	823,745
2.D Non-Energy Products from Fuels and Solvent Use	27,829	21,461	34,374	26,473	35,317	41,626
2.F Product Uses as Substitutes for Ozone-Depleting Substances	0	490,473	535,274	549,436	577,883	583,966
Total IPPU GHG emissions	1246,435	3641,582	3902,417	3659,01	4137,718	4581,031

Figure 14. GHG emissions from the IPPU sector

- **1990:** 1,246kt CO_2 eq.
- **2024:** 4,581kt CO_2 eq.
- **Change:** Increase of 267.5%.

Trend: In Azerbaijan, the industrial sector has significantly expanded over the past twenty years, primarily due to subcategories such as petrochemical and cement production. The demand for such materials has increased due to large-scale urbanization projects associated with the growing population, including the modern development of Baku as a city and other infrastructure projects.

Comparison with the 1990 reference year: the total reported emissions in 2024 were 267.5% higher than in 1990. However, this comparison includes emissions from category 2.F in 2024, whereas category 2.F was not estimated for 1990. On a comparable basis, excluding category 2.F from the 2024 total, emissions from categories 2.A–2.D increased from 1,246.435 Gg CO_2-eq in 1990 to 3,997.064 Gg CO_2-eq in 2024, representing an increase of approximately 220.7%.

The latest inventory estimates show that the mineral industry remains the largest contributor to IPPU emissions. Between 1990 and 2024, emissions from mineral production increased by approximately 6.0 times, while emissions from the chemical industry increased by approximately 3.5 times. Emissions from metal production increased by 34.3%, and emissions from lubricant use increased by 49.6%. These trends reflect changes in industrial production volumes, the development and modernisation of industrial facilities, and the application of the relevant inventory methodologies.

Between 2023 and 2024, emissions from the mineral industry increased by 15.3%, mainly reflecting higher clinker production and associated cement-process emissions. In contrast, emissions from the chemical industry decreased by 9.1%, primarily due to a 21.8% reduction in ethylene production, partly offset by a 4.4% increase in methanol production. Emissions from the metal industry increased by 26.7%, largely reflecting the increase in estimated emissions from aluminium production, alongside higher steel production. Emissions from lubricant use increased by 17.9%, corresponding to higher reported consumption.

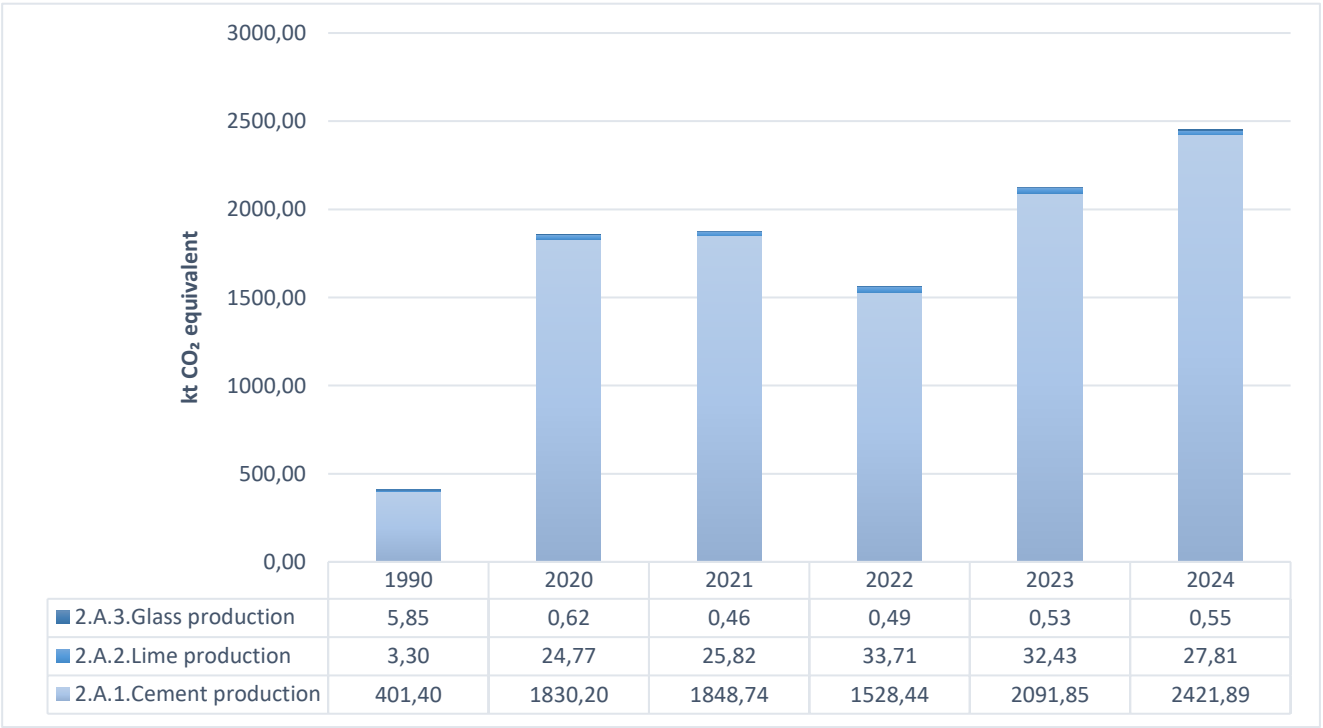
Emissions from category 2.F increased by approximately 1.1% between 2023 and 2024, reaching 583.966 Gg CO_2-eq. This category represents an additional quantified source in the current inventory compared with BTR1, reflecting improved Customs data compilation and the estimation of emissions from bulk fluorinated gases, primarily used in refrigeration and stationary air conditioning. The estimates also include HFC-227ea emissions from fire-protection applications.

Overall, the updated estimates indicate that changes in IPPU emissions during 2023–2024 were driven primarily by developments in cement and aluminium production, while changes in petrochemical production partly offset the increase. The expanded assessment of fluorinated gases also provides a more complete picture of the sector's emissions.

2.1.2.2.1. MINERAL INDUSTRY (2.A)

Figure 15. GHG emissions from Mineral Industry category

- **1990:** 411kt CO_2 eq.
- **2024:** 2,450kt CO_2 eq.
- **Change:** Increase of 497%

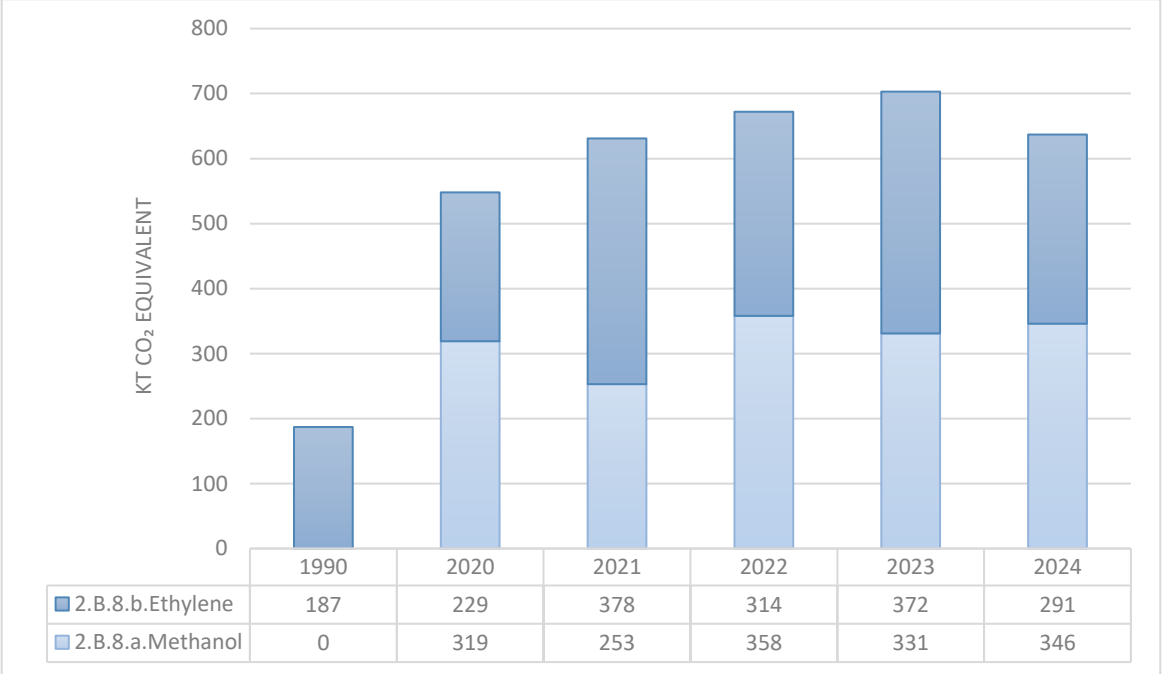


	1990	2020	2021	2022	2023	2024
2.A.3.Glass production	5,85	0,62	0,46	0,49	0,53	0,55
2.A.2.Lime production	3,30	24,77	25,82	33,71	32,43	27,81
2.A.1.Cement production	401,40	1830,20	1848,74	1528,44	2091,85	2421,89

Trend: The construction boom has led to a significant increase in cement production, which is one of the main reasons for the rise in emissions. As Azerbaijan continues to develop its infrastructure, the demand for cement has grown, resulting in an increase in emissions in this sector.

This trend is reflected in the inventory estimates, with emissions from cement production increasing from 401.40 Gg CO_2-eq in 1990 to 2,421.89 Gg CO_2-eq in 2024. Between 2023 and 2024, cement-production emissions increased by approximately 15.8%. Lime-production emissions decreased from 32.43 Gg CO_2-eq in 2023 to 27.81 Gg CO_2-eq in 2024, while emissions from glass production remained relatively low at 0.55 Gg CO_2-eq in 2024. Consequently, the overall increase in mineral-industry emissions is primarily attributable to the growth in cement production.

2.1.2.2.2. CHEMICAL INDUSTRY (2.B)



	1990	2020	2021	2022	2023	2024
2.B.8.b.Ethylene	187	229	378	314	372	291
2.B.8.a.Methanol	0	319	253	358	331	346

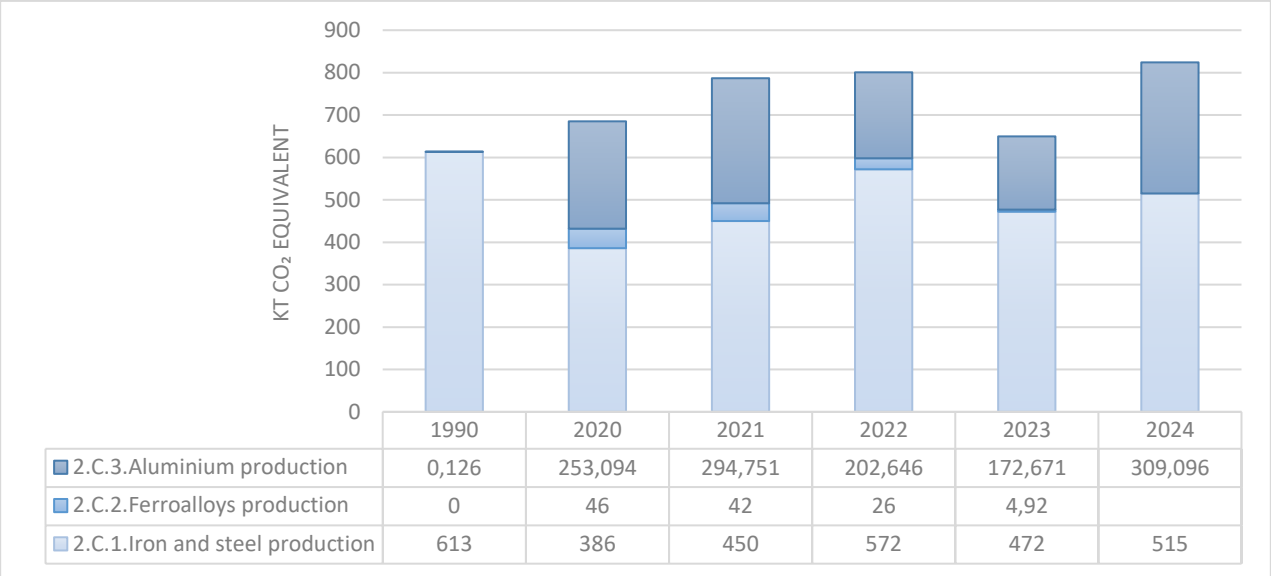
Figure 16. GHG emissions from Chemical Industry, kt CO_2 eq.

- **1990:** 194.73 kt CO_2 eq.
- **2024:** 750 kt CO_2 eq.
- **Change:** Increase of 250%

Trend: The growth of the petrochemical industry has led to an increase in emissions. It should be noted that in 1990, the methanol production didn't take place.

Emissions increased by approximately 4.3% in 2023, followed by a decrease of 9.1% in 2024. These fluctuations reflect changes in production activity: methanol production increased from 331 kt in 2023 to 346 kt in 2024, while ethylene production decreased from 372 kt to 291 kt. The decrease in ethylene production in 2022 was attributed by the data provider to the two-month shutdown of the "Azerikimya" PU for major repairs.

2.1.2.2.3.METAL INDUSTRY (2.C.)



	1990	2020	2021	2022	2023	2024
2.C.3.Aluminium production	0,126	253,094	294,751	202,646	172,671	309,096
2.C.2.Ferroalloys production	0	46	42	26	4,92	
2.C.1.Iron and steel production	613	386	450	572	472	515

Figure 17. GHG emissions from Metal Industry, kt CO_2 eq.

- **1990**: 613 kt CO_2 eq.
- **2024**: 824 kt CO_2 eq.
- **Change**: Increase of 34%

Trend: The overall growth of the metal industry has been driven by the introduction of ferroalloy and aluminum production in the country. Although iron and steel production has decreased from 613 kt CO_2 equivalent in 1990 to 572 kt CO_2 equivalent in 2022, the launch of ferroalloy and aluminum production has contributed to the overall rise in GHG emissions within the metal industry. However, the total output of ferroalloys and aluminum production saw a decline in 2022 compared to 2020. In 2023, total emissions decreased to 650.13 kt CO_2 eq., mainly reflecting lower emissions from iron and steel, ferroalloy and aluminium production. In 2024, emissions increased to 823.75 kt CO_2 eq., driven primarily by the increase in aluminium production emissions (from 172.67 to 309.10 kt CO_2 eq.) and iron and steel production emissions (from 472 to 515 kt CO_2 eq.). The reported increase in aluminium production activity should be interpreted with the data-quality limitation identified during the BTR1 technical expert review: the national statistics may not cover all aluminium products consistently, and the classification of primary aluminium and aluminium products requires further investigation. The current Tier 1 estimate assumes that all reported production represents primary aluminium and is therefore considered conservative. This issue has been identified for improvement in the next inventory submission.

2.1.2.2.4. NON-ENERGY PRODUCTS FROM FUELS AND SOLVENT USE (2.D.)

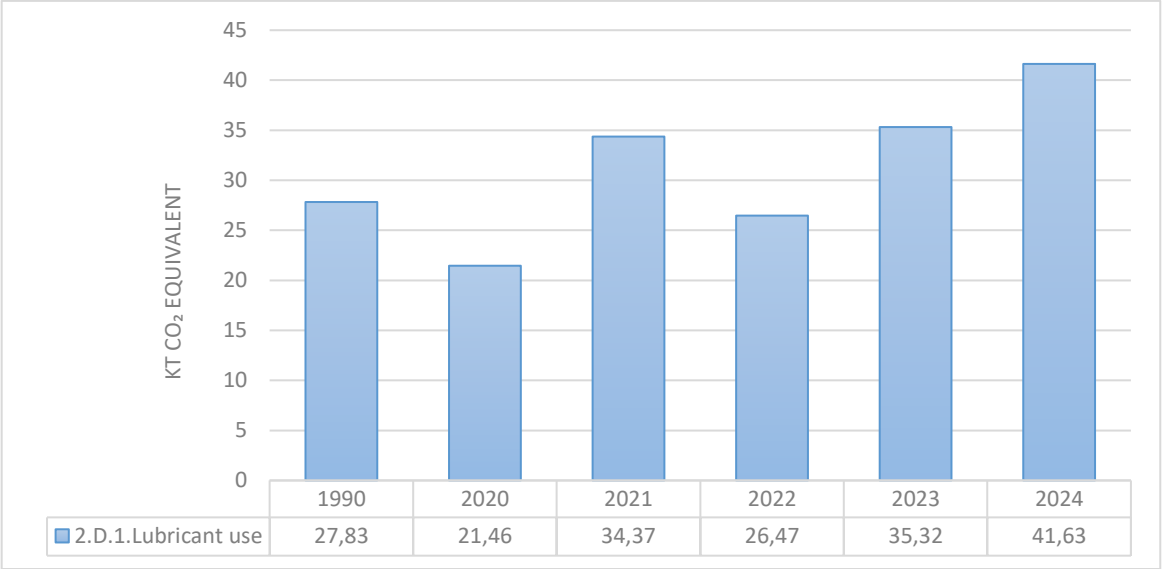


Figure 18. GHG emissions from Lubricant use, kt CO_2 eq.

- **1990:** 27.83 kt CO_2 eq.
- **2024:** 41.63kt CO_2 eq.
- **Change**: Increase of 49.6%

Trend: The trend of GHG emissions from lubricant use remained relatively stable, with a slight decrease of 4.9%, from 27.83 kt CO_2 equivalent in 1990 to 26.47 kt CO_2 equivalent in 2022. This decrease is attributed to the increase in technological equipment and the expansion of the transportation system in the country. However, emissions subsequently increased to 35.32 kt CO_2 eq. in 2023 and 41.63 kt CO_2 eq. in 2024, representing an increase of approximately 57.3% between 2022 and 2024. Overall, the latest estimates indicate that emissions in 2024 were approximately 49.6% higher than in 1990. These changes reflect variations in reported lubricant consumption and use over the time series.

2.1.2.2.5. FLUORINATED GASES (F-GASES) – PRODUCT USES AS SUBSTITUTES FOR ODS (2.F)

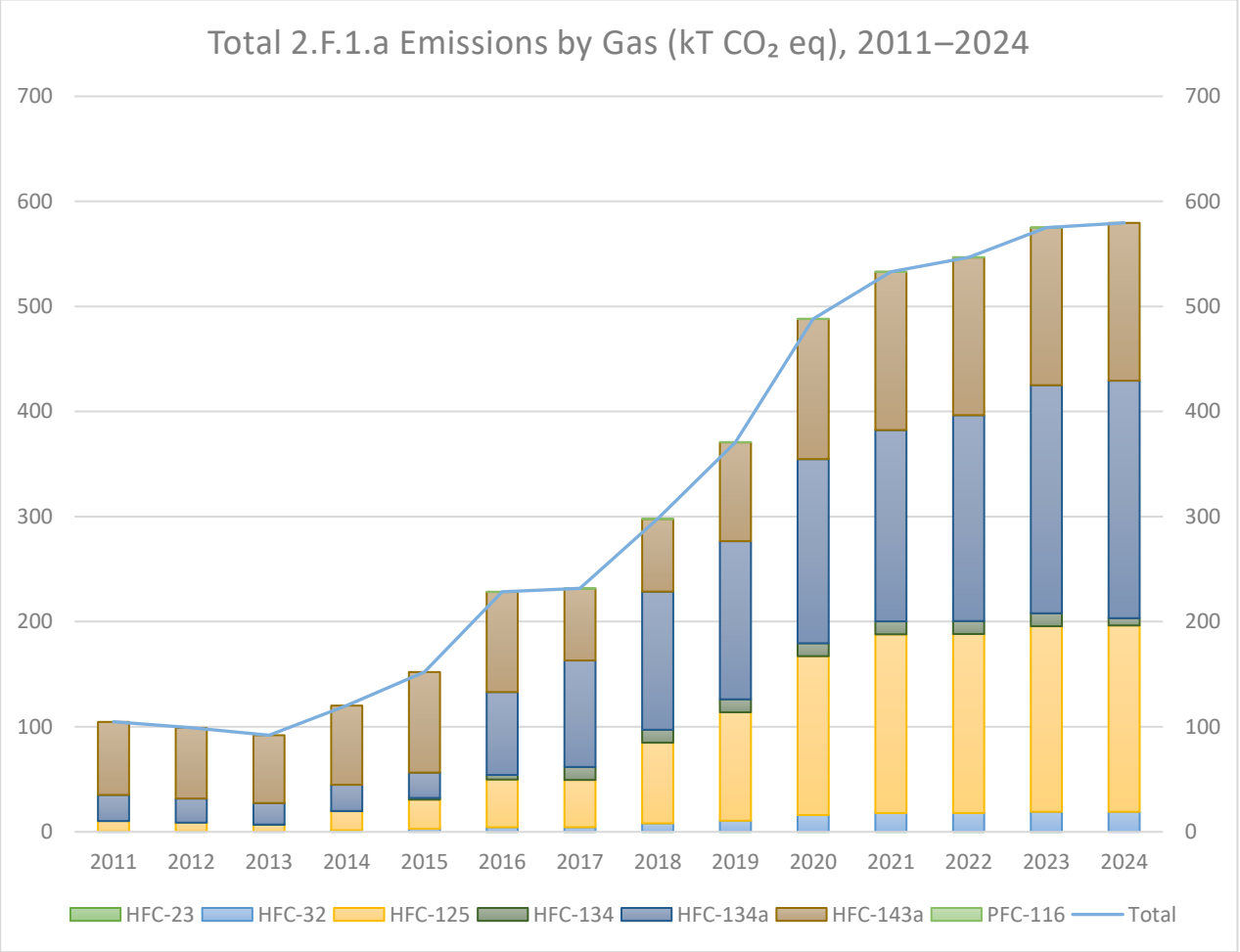


Figure 19. GHG emissions from Product Uses as Substitutes for ODS (2.F), kt CO_2 eq.

- **1990**: NO
- **2024**: 583.97 kt CO_2 eq.
- **Change** (2020–2024): increase of approximately 19.1%.

Trend: Emissions from HFCs used as substitutes for ozone-depleting substances (ODS) increased from 490.47 kt CO_2 eq. in 2020 to 583.97 kt CO_2 eq. in 2024. Following increases of approximately 5.2% in 2023 and 1.1% in 2024, the estimates indicate a continued but slower increase in emissions. The estimates are driven predominantly by HFC use in refrigeration and stationary air-conditioning systems, with emissions calculated using a refrigerant-bank approach based on bulk HFC import data. Although HFCs are used as alternatives to ODS, they do not deplete the ozone layer; however, they are potent greenhouse gases subject to the phasedown provisions of the Kigali Amendment to the Montreal Protocol.

2.1.3. Agriculture Sector

2.1.3.1. HISTORICAL TREND IN AGRICULTURE SECTOR

Historically, Azerbaijan has been an agrarian country, and agriculture has played a strategic role in the country's development at all times.

During the Soviet era, in 1986, there were 808 state farms and 608 collective farms in the republic, with 4.1 million hectares of land allocated for agriculture. Arable land amounted to 2.73 million hectares, and pastures covered 2.1 million hectares. Crop production made up 70% of agricultural output, with cotton being the main cash crop, concentrated in the Kura-Aras lowlands. Tobacco was grown in the Greater and Lesser Caucasus, and tea was cultivated in the Lankaran lowlands. Grain production accounted for 31% of crop production. In 1986, 855 thousand tons of vegetables and 1,539 thousand tons of grapes were produced. Subtropical fruit production was also significant. Livestock farming, focusing on meat and dairy production, was well developed, with 2 million head of cattle and 5.7 million sheep and goats in the country. Silk farming was also common

Crop production is one of Azerbaijan's traditional agricultural sectors. According to data from 1909-1913, per capita grain production in Azerbaijan was 2.5 times higher than the world average (233 kg) and 1.3 times higher than in then-developed countries like Germany, France, and Sweden (455 kg). Tea was introduced to Azerbaijan's Lankaran region in 1912, and the first tea factory was built in Lankaran in 1937. Mass tea production began thereafter, reaching 36,000 hectares in 1970-1980, with over 34,000 tons of tea produced. According to SSC data, in 2014, 474.2 tons of tea leaves were produced in the country, approximately 20% less than in 2013. The "State Program for the Development of Tea Growing in the Republic of Azerbaijan for 2018–2027," approved on February 12, 2018, aimed to strengthen state support, use the sector's potential effectively, and increase interest in tea production.

The total area of vineyards in Azerbaijan reached 280 thousand hectares in 1984, producing 2.1 million tons of grapes, with a yield of 100 centners per hectare. According to SSC data, 37.1 thousand tons of grapes were harvested by September 1, 2014, an increase of 5.2 thousand tons compared to 2013.

Horticulture is a specialized agricultural sector in Azerbaijan. The Guba-Khachmaz region specializes in pome fruits, the Shaki-Zagatala region in nuts (such as chestnuts, walnuts, and hazelnuts), the Nakhchivan Autonomous Republic in stone fruits (such as apricots and peaches), the Kura-Aras lowland in dry subtropical fruits (such as pomegranates and quinces), the Lankaran region in citrus fruits (such as mandarins, oranges, feijoas, and lemons), and the Absheron Peninsula in southern fruits (such as figs, olives, pistachios, and almonds). According to the Ministry of Agriculture, the area of orchards in the country was 130,467 hectares in 2011, producing 765,818 tons of fruit (excluding grapes), with a yield of 71.7 centners per hectare.

Azerbaijan was recognized as an agricultural country until the end of the 20th century. Due to its extensive agricultural resources, it was a major producer of agricultural goods. The production of grain, cotton, grapes, vegetables, and fruits thrived, along with livestock farming. In the 1970s-1980s, agriculture contributed 25% of the country's GDP, whereas it currently accounts for approximately 5%.

In the 1990s, the transition from a planned economy to a market economy led to a decline in all economic sectors, including agriculture. The return of land to the population and the creation of a favorable environment for agricultural development revitalized the sector. The sector has been consistently prioritized in state programs and plans, as reflected in the "Azerbaijan Republic's Strategy for Social-Economic Development for 2022-2026," which includes a direction focused on "Developing Sustainable and Competitive Agriculture and Agribusiness."

The country's local production potential and infrastructure support have been enhanced to strengthen food security. Based on the country's available land, water, and climate resources, self-sufficiency in primary agricultural products is generally at an acceptable level. In addition to local production potential, the development of storage and processing facilities for food supplies is of critical importance for food security. The establishment of local processing industries and infrastructure for products with relatively high import dependency, due to natural resource limitations, ensures the country's food security.

During the reporting period, there was a notable increase in agricultural sector emissions in Azerbaijan, primarily linked to growth in livestock production, particularly cattle farming. Increased emissions from enteric fermentation and manure management reflect the expansion of livestock farming.

Agricultural soil emissions also increased, mainly due to intensified crop production and the use of fertilizers. Overall, sectoral emission trends reflect the impact of economic changes and modernization efforts in rural areas following the collapse of the Soviet Union, which boosted agricultural activities. Although agriculture remains a vital part of the Azerbaijani economy, its contribution to national emissions increased until 2016 and has since stabilized gradually.

The third sector as per classification of the IPCC 2006 methodology is Agriculture, Forestry and other land use sector. 3 key categories of the AFOLU sector are as follows:

1. 3A - Domestic animals
2. 3B - Lands
3. 3C - Aggregate resources and sources of emission of gases other than CO_2

Among these, categories 3A and 3C include mainly emissions, while category 3B include mainly absorption.

In the current report, the amount of absorption in the 1990 reference year differs from the amount of absorption calculated in the Fourth National Communication. This is due to the fact that at the time of the development of the National Communication Report, there was no data on the subcategories of “Pastures” and “Settlement lands” of the AFOLU sector.

3A - Domestic animals category is the key category of the AFOLU sector on GHG emissions. In this category, CH_4 and N_2O greenhouse gases are emitted into the atmosphere from the internal fermentation of animals and the management of manure. Compared to the reference year of 1990, relevant change in the number of cattle, that is the main sources of the category, was occurred in 2024 (figure 19).

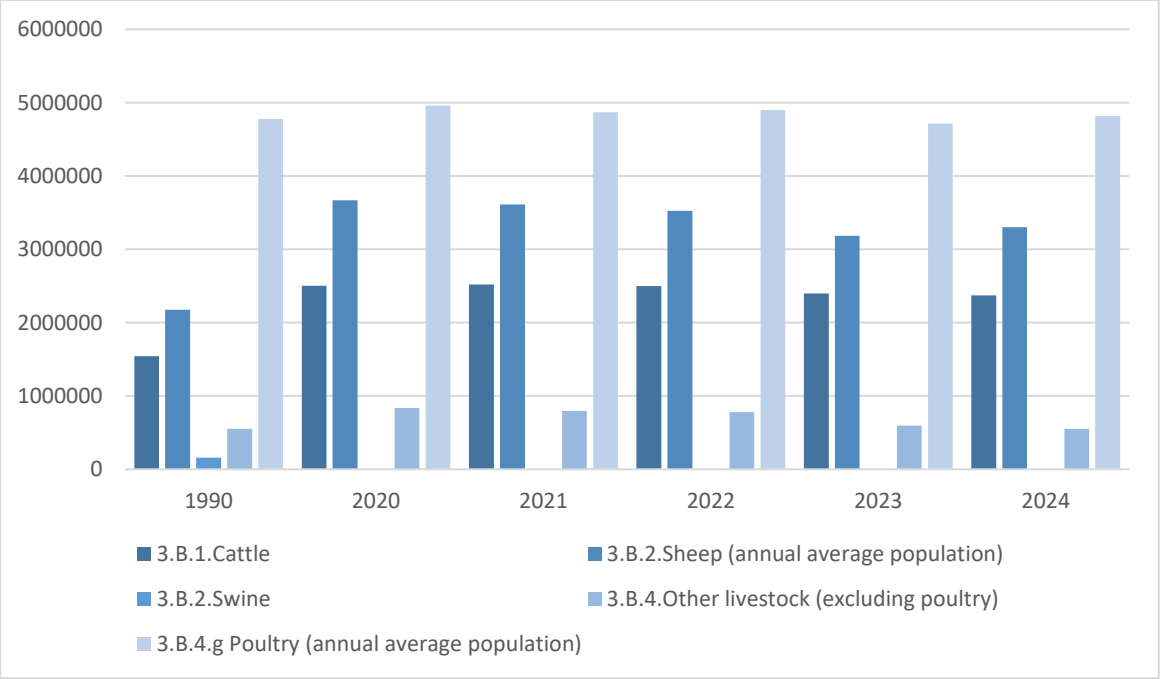


Figure 19. Change in the number of domestic animals that are the main sources of methane

As can be seen from the figure, the number of dairy cows, sheep and goats increased in 2024 as compared to 1990.

3C2. Liming. Lime is produced in Azerbaijan for the construction purposes. However, there is no information about its use for the purpose of injection into the soil.

3C3.Urea application. Various fertilizers are used for plants to grow quickly and give a good harvest. CO_2 emissions occur when urea is applied to agricultural soils as a result of the hydrolysis of urea and the release of its carbon content into the atmosphere. According to the IPCC (2006) methodology, when urea is applied to the soil, carbon dioxide is released into the atmosphere as a result of the appropriate chemical reaction from the mixture of fertilizer with water. Carbamide is distinguished from other nitrogen fertilizers by its low cost, convenient application and high productivity in agriculture. Carbamide is considered a reliable and economical product in terms of storage and transportation due to the fact that it does not pose a fire or explosion hazard. Carbamide is widely used in the production of cattle feed and other chemicals, as well as in pharmaceuticals.
Previously, nitrogen fertilizers were mainly imported to Azerbaijan. At present, the carbamide plant put into operation in the country meets the needs of Azerbaijan.

3C4. Direct N_2O emissions from cultivating areas. In this sub-category of the 3C category of AFOLU sector, N_2O is directly released into the atmosphere as a result of the appropriate chemical reaction of nitrogen fertilizers injected into the soil with water and other mineral substances. According to the amount of carbamide used from the SSC data, the amount of N_2O gas released into the atmosphere was calculated according to the IPCC methodology. The result of calculations is given in the below figure.

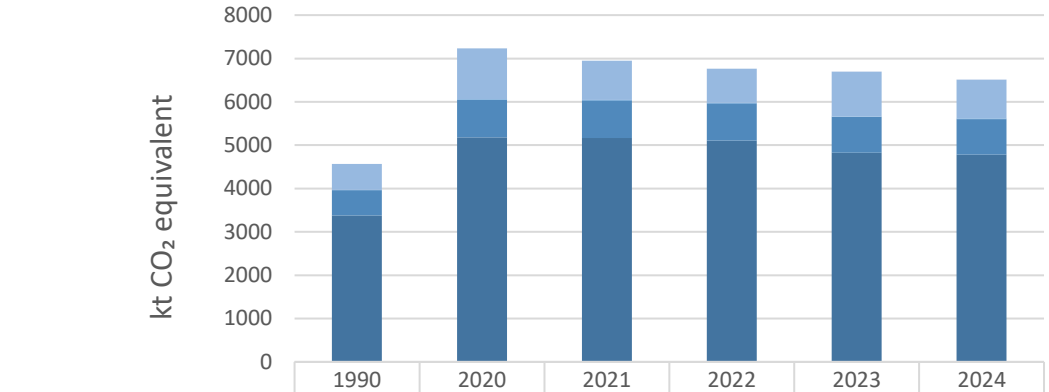
3C5. Indirect N_2O emissions from the cultivating areas. There is no information on the amount of minerals and amount of organic substances in the lands allocated for cultivation in Azerbaijan.

3C6. Indirect emission of N_2O from the collection, storage and use of manure. One of the sources of category 3C is the management of cattle manure. At this time, a direct N_2O is emitted. Data on the amount of this emission over the years is given in the following figure.

3C7. Rice cultivation subcategory. Rice fields that generate the CH_4 emission are among the main sources of the 3C category. Rice cultivation areas, like artificial wetlands, are characterized by high humidity, high nutrient content and low oxygen content. The main factor determining the flow of methane into the atmosphere is the ratio of methane and methanogenic bacteria. Formation of CH_4 emission depends on the temperature of the soil, as well as the level of groundwater.

Data on the amount of CH_4 emitted from the rice plantation fields is given in the figure 23. In the last National Data, the area of rice cultivation in 1990 was unknown. At present, CH_4 emissions are included in the report.

2.1.3.2. RECENT TREND IN AGRICULTURAL SECTOR



	1990	2020	2021	2022	2023	2024
3.H.Urea application		0,16	0,07	0,015	0,047	0,072
3.D. Agricultural soils	598,72	1176,72	896,6	780,97	1028,57	886,16
3.C.Rice cultivation	7,67	12,78	13,14	13,33	13,50	21,31
3.B. Manure management	581,31	867,57	868,72	863,02	824,95	815,24
3.A. Enteric Fermentation	3377,04	5177,38	5163,59	5102,67	4824,64	4782,6

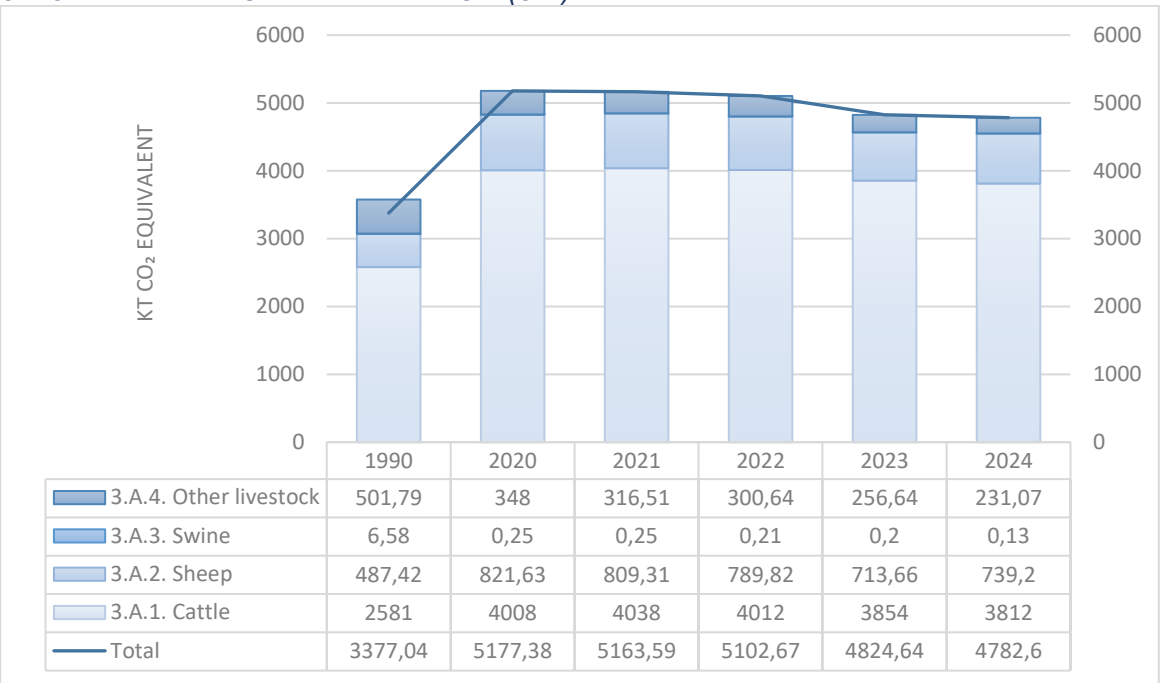
Figure 20. GHG emissions from the Agricultural sector

- **1990:** 4,564.72kt CO_2 eq.
- **2024:** 6,505.42kt CO_2 eq.
- **Change:** Increase of 42.5%

Trend: Azerbaijan's agricultural sector has expanded further after 1990, with a focus on livestock farming. Cattle farming, in particular, has contributed to the increase in methane emissions, primarily through enteric fermentation and manure management. Starting from 2020, the 30-year trend of rising emissions has shifted to a decline. Following a peak of 7,234.61 kt CO_2-eq. in 2020, total agricultural emissions decreased to 6,942.12 kt in 2021, 6,760.01 kt in 2022, 6,691.72 kt in 2023 and 6,505.42 kt in 2024. This represents a decrease of 10.1% between 2020 and 2024 and 2.8% between 2023 and 2024. Nevertheless, the 2024 emission level remained 42.5% above the 1990 level.

The updated manure-management estimates also incorporate poultry-related emissions, based on the available poultry population data and applicable IPCC default parameters. Poultry contribute to manure-management emissions but are not included in enteric fermentation estimates.

3.1.3.2.1. ENTERIC FERMENTATION (3.A)



	1990	2020	2021	2022	2023	2024
3.A.4. Other livestock	501,79	348	316,51	300,64	256,64	231,07
3.A.3. Swine	6,58	0,25	0,25	0,21	0,2	0,13
3.A.2. Sheep	487,42	821,63	809,31	789,82	713,66	739,2
3.A.1. Cattle	2581	4008	4038	4012	3854	3812
Total	3377,04	5177,38	5163,59	5102,67	4824,64	4782,6

Figure 21. GHG emissions from Enteric fermentation

- **1990:** 3,377.04 kt CO_2 eq.
- **2024:** 4,782.6kt CO_2 eq.
- **Change:** Increase of 41.6%

Trend: Livestock, particularly cattle, has become a significant agricultural product contributing to methane emissions in Azerbaijan. Since the base year of 1990, the shift towards more intensive livestock farming, especially in plains and foothill areas, has led to an increase in methane emissions from enteric fermentation. After 2016, these emissions stabilized and have relatively decreased from 2020 to 2022. This declining trend continued in 2023 and 2024, with total emissions decreasing from 5,102.67 kt CO_2-eq. in 2022 to 4,824.64 kt in 2023 and 4,782.60 kt in 2024. This represents a decrease of approximately 7.6% between 2020 and 2024 and 0.9% between 2023 and 2024. Nevertheless, emissions in 2024 remained 41.6% above the 1990 level.

Cattle remained the predominant source of enteric fermentation emissions, accounting for approximately 79.7% of the category total in 2024. Sheep accounted for approximately 15.5%. Between 2023 and 2024, cattle-related CH_4 emissions decreased from 137.6452 Gg to 136.1500 Gg, while sheep-related emissions increased from 25.4880 Gg to 26.4000 Gg.

2.1.3.2.2. MANURE MANAGEMENT (3.B)

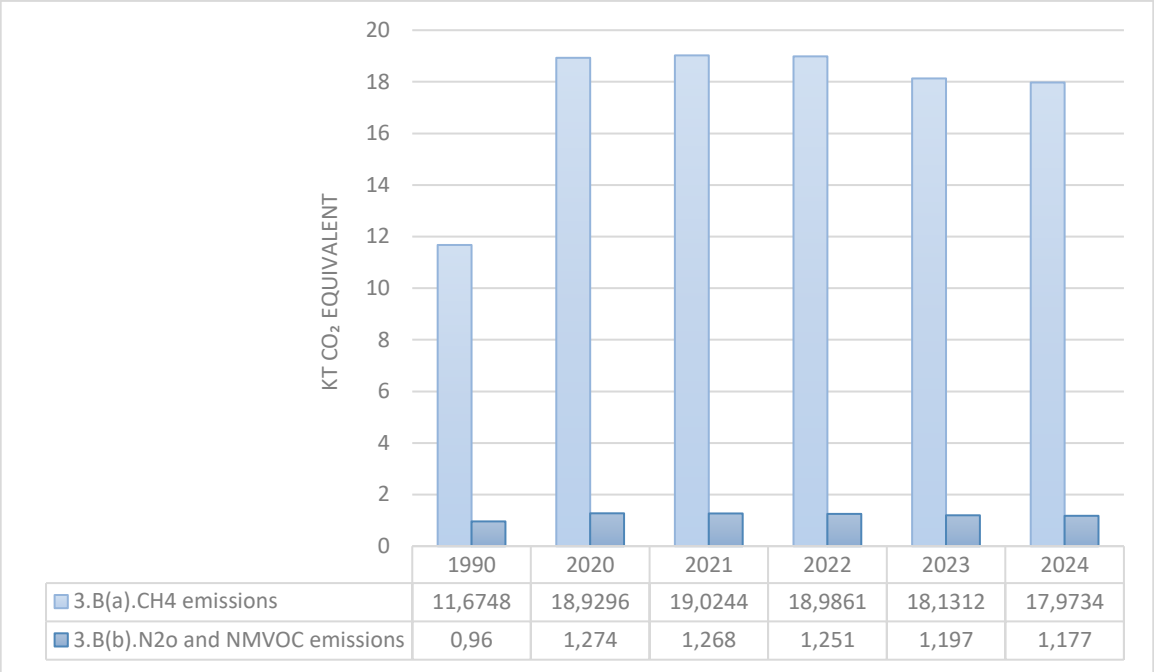


Figure 22. GHG emissions from Manure management

- **1990:** 581.31kt CO_2 eq.
- **2022:** 815.28kt CO_2 eq.
- **Change:** Increase of 40.2%

Trend: The increase in livestock numbers has resulted in a corresponding rise in emissions from manure management, particularly in areas where animal waste is not effectively managed or treated.
Compared with 1990, total emissions from manure management increased from 581.31 kt CO_2-eq. to 815.28 kt CO_2-eq. in 2024, representing an increase of 40.2%. During 2020–2022, emissions remained relatively stable, increasing slightly from 867.57 kt CO_2-eq. in 2020 to a peak of 868.72 kt in 2021, before declining to 863.03 kt in 2022. This downward trend continued in 2023 and 2024, with emissions decreasing to 824.95 kt and 815.28 kt CO_2-eq., respectively. The decrease between 2023 and 2024 was approximately 1.2%.

The updated estimates include poultry manure-management emissions, which amounted to 0.0955 Gg CH_4 and 0.0611 Gg direct N_2O in 1990, and 0.0963 Gg CH_4 and 0.0628 Gg direct N_2O in 2024. These estimates are incorporated into the respective aggregate manure-management emissions.

2.1.3.2.3. RICE CULTIVATION (3.C)

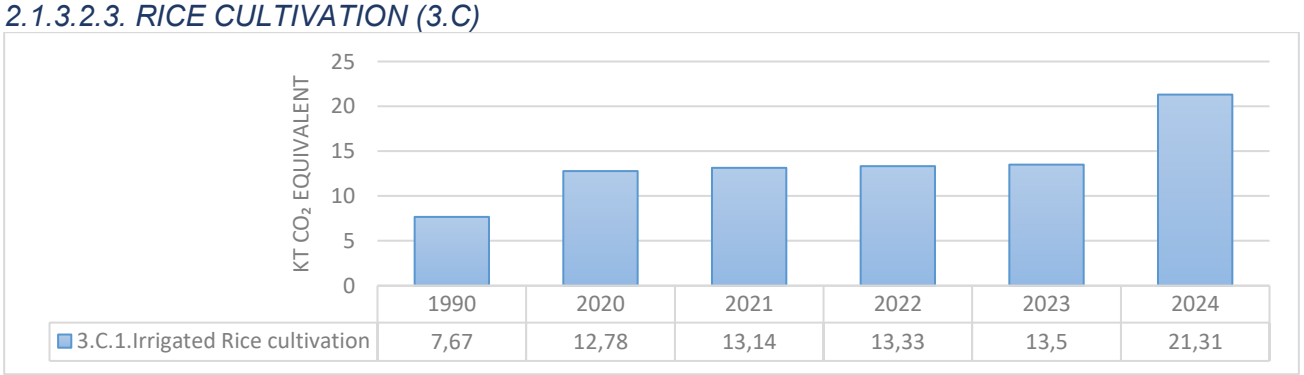


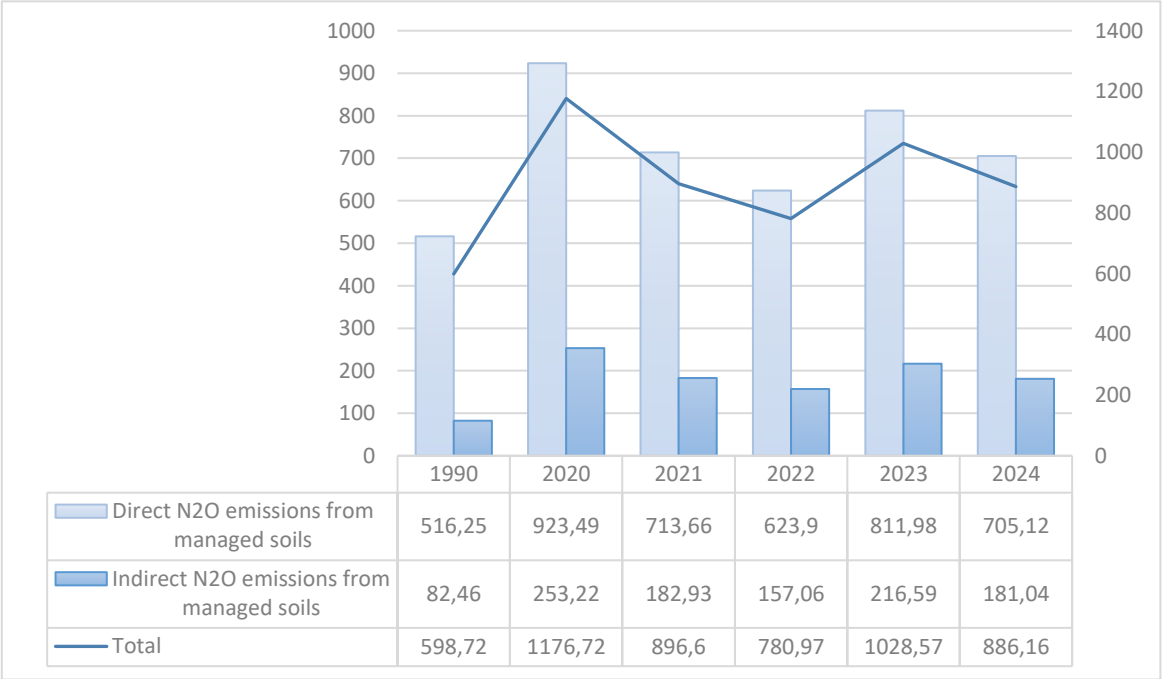
Figure 23. GHG emissions from Rice cultivation

- **1990:** 7.67 kt CO_2 eq.
- **2024:** 21.31kt CO_2 eq.
- **Change:** Increase of 178%

Trend: An increase in the land area dedicated to rice production results in a significant increase from 7.67 kt CO_2 equivalent in 1990 to 13.33 kt CO_2 equivalent in 2022, indicating a 74% increase over this period. This upward trend continued in 2023, when emissions reached 13.50 kt CO_2-eq., and accelerated in 2024, reaching 21.31 kt CO_2-eq. The increase between 2023 and 2024 was 57.8%, bringing the overall increase since 1990 to 178.0%.

The increase in 2024 coincided with an expansion in the reported rice sown area from 3,171.9 hectares in 2023 to 5,003.8 hectares in 2024 (+57.8%).

2.1.3.2.4. AGRICULTURAL SOILS (3.D)



	1990	2020	2021	2022	2023	2024
Direct N2O emissions from managed soils	516,25	923,49	713,66	623,9	811,98	705,12
Indirect N2O emissions from managed soils	82,46	253,22	182,93	157,06	216,59	181,04
Total	598,72	1176,72	896,6	780,97	1028,57	886,16

Figure 24. Direct and Indirect N_2O emissions from Agricultural soils, kt CO_2 eq.

- **1990**: 598.72kt CO_2 eq.
- **2024**: 886.16kt CO_2 eq.
- **Change**: Increase of 48%

Trend: The data on direct and indirect nitrous oxide (N_2O) emissions from agricultural soils indicates a notable increase from 598.72 kt CO_2-eq. in 1990 to 780.97 kt CO_2-eq. in 2022, representing a 30.4% increase over this period. Emissions subsequently increased to 1,028.57 kt CO_2-eq. in 2023, before declining to 886.16 kt CO_2-eq. in 2024. Despite this decrease, the 2024 emission level remained 48.0% above the 1990 level. The significant increase in N_2O emissions over the inventory period reflects the contribution of agricultural activities and nitrogen inputs to managed soils. Between 1990 and 2024, direct N_2O emissions increased by 36.6%, while indirect N_2O emissions increased by 119.5%.

2.1.3.2.5. . UREA APPLICATION (3.H)

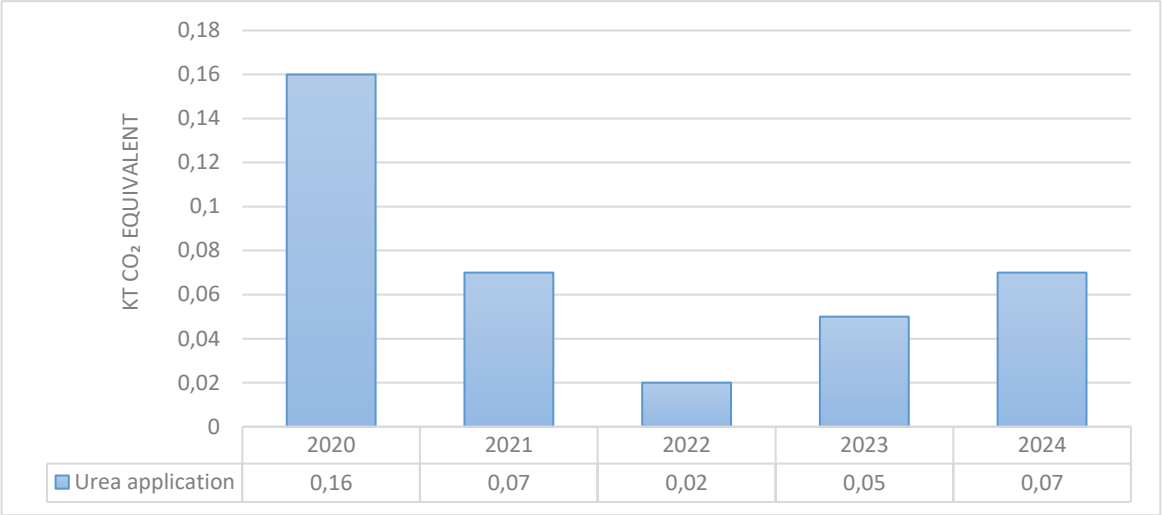


Figure 25. GHG emissions from Urea application

- **1990**: NE
- **2020**:0.16 kt CO_2 eq.
- **2024**: 0.072kt CO_2 eq.

Trend: Due to lack of data on urea application in 1990 emissions were not estimated for 1990. Emissions decreased sharply from 2020 to 2022, dropping from 212.40 kt CO_2 equivalent to 20.30 kt CO_2 equivalent. CO_2 emissions from urea application decreased considerably from 0.1558 kt CO_2-eq. in 2020 to 0.0149 kt CO_2-eq. in 2022, representing a reduction of 90.4%. However, emissions subsequently increased to 0.0472 kt CO_2-eq. in 2023 and 0.0718 kt CO_2-eq. in 2024, corresponding to an increase of 52.0% between 2023 and 2024. Despite this recovery, the 2024 emission level remained 53.9% below the 2020 level.

2.1.4. Land Use, Land-Use Change, and Forestry (LULUCF)

2.1.4.1. HISTORICAL TREND IN LULUCF SECTOR

3B1 - Forest land is one of the national treasures of states. The protection of forests, which provide humanity with oxygen, and assistance in their development should become the sacred duty of every country.

The total area of forest areas in Azerbaijan was about 1.04 million ha by the end of 2022 (SSC, 2023). 49% of the forest areas are located in the Greater Caucasus, 34% in the Lesser Caucasus and 15% in the Talysh mountains. Only 2% of the forest area belongs to the lowland zone.

In Azerbaijan's forests, broadleaf species make up 88%, softwood species account for 8.9%, and coniferous species constitute only 0.06%.

In 1993-2020, fascinating forests, city parks, gardens and arable lands of the population living there, and immense pastures were looted, burned and destroyed in the territory of 20% of the territory of Azerbaijan under Armenian occupation. Preliminary assessments carried out in order to determine the harm and losses caused as a result of Armenian occupation, showed that 54,328 hectares out of 228 thousand hectares of forest-covered areas within the forest fund were destroyed. As a result, the humus layer of soils was destroyed, a large amount of greenhouse gases was emitted into the atmosphere.

Unfortunately, for 30 years none of the relevant international organizations has expressed their opinion to Armenia in this regard.

After the collapse of the country of the Soviets, the political situation in the country, the severance of economic ties with neighboring countries and other socio-economic situations had a negative impact on the development of forests as well. Thus, after the supply of coal to the country stopped, the forests were degraded as a result of the use of forests as fuel by the population of districts and villages due to problems in the supply of energy resources.

After the establishment of stability in the country, forest management was improved. The management of forests was entrusted to the Ministry of Ecology and Natural Resources, established in 2001. In this regard, the “Forest Development Service” was established in the ministry. The following areas of activity of the service were identified:

3B2 - The Croplands subcategory includes all land plots suitable for agriculture. Lands suitable agriculture consist of cultivation areas, pacified lands, perennial plantings and pasture areas with hayfields. Change dynamics in the designations of these lands from 1990 to 2022 is presented in the table below.

Indicators	1990	2022	2023	2024	Difference
Arable lands	1,589.0	2,052.8	2,037.4	2,034.2	28%
Fallow lands	80.8	39.1	54.3	59.0	-27%
Perennial crops	347.4	273.6	273.5	274.6	-21%
Hayfields and pastures	2,365.7	2,415.0	2,414.4	2,406.4	1.7%
Total	**4,382.9**	**4,780.5**	**4,779.6**	**4,774.2**	**8.9%**

Table 16. Dynamics of changes in land plots suitable for agriculture, thousand ha

As it can be seen from the table, the volume of land suitable for agriculture increased in 2024 by 391.3 thousand ha as compared to the 1990 reference year. The increase was primarily attributable to the expansion of arable land, which grew by 445.2 thousand ha (28.0%). In contrast, the areas of fallow land and perennial crops decreased by 21.8 thousand ha (27.0%) and 72.8 thousand ha (21.0%), respectively, while the area of hayfields and pastures increased slightly by 40.7 thousand ha (1.7%).

3B3 – **Grassland**. Natural hayfields and pastures in Azerbaijan are located mainly in Gobustan, Jeyranchol, Ajinohur, Shirvan, Mil, Karabakh, Salyan plains, covering 67% of natural pastures, and in the mountains of the Greater and Lesser Caucasus, Talysh covering the middle mountainous, subalpine and alpine zones, account for 33% of natural pastures.

The reason for the decrease in Grassland is associated with the development of urban planning, road structure, the expansion of other works of state importance, as well as the transfer for private ownership.
It should be noted that the national data did not contain information about pastures as of 1990. The SSC is improving its statistics by collecting the missing data of the 1990 reference year. At present, major part of information about the lands has been posted, including information about pastures and areas of settlement lands.
3B4 – Wetlands cover a very small portion of the country, approximately 150,426 hectares. According to the IPCC classification, wetland areas are included under the managed subcategory, while rivers and natural lakes fall under the unmanaged subcategory. The GHG emissions from wetlands primarily arise from the peat deposits in these areas (IPCC 2006). Since the peat deposits in Azerbaijan's wetland areas are minimal, their potential GHG emissions are negligibly small.
3B5 - Residential (settlement) lands. The territory of the Republic of Azerbaijan is divided into fourteen major including Baku and minor economic regions. Baku has a special status as the capital city of Azerbaijan. The remaining economic regions of Azerbaijan include cities and separate regions. In Baku and other regions of the Republic there are areas with trees and greenery such as parts and gardens that do not belong to the forest fund.
3B6 - Other lands subcategory include bare rocks, clay-salt water on the surface, debris cones of river banks, places of man-caused deformation, coastal sands and other unregistered places. That is, these are lands not included in the Lands subcategories listed earlier.
Data on other types of lands and their distribution in the territory of the Republic of Azerbaijan is shown in the following figure.

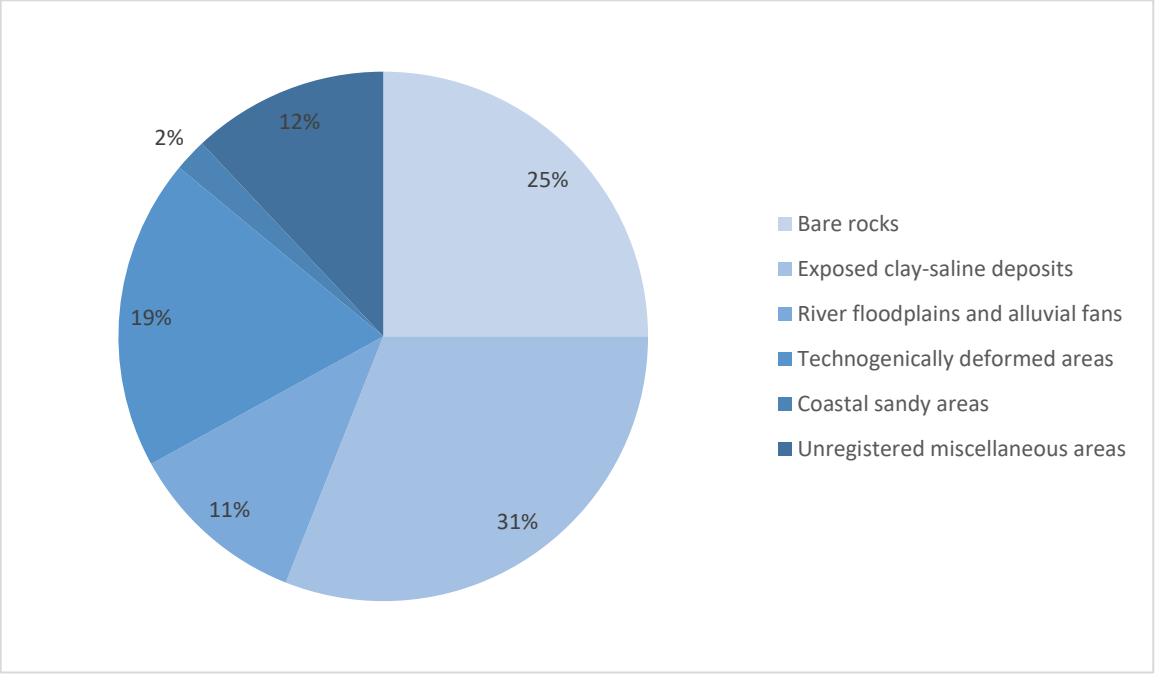


Figure 26. Structure of Other land category

These lands are located mainly in mountainous and foothill places, around volcanoes and their rocks, in semi-desert zones.

3.C – Aggregate Sources and Non-CO_2 Emission Sources on Land In the IPCC (2006) methodology, all sources not included in the 3A and 3B categories of the AFOLU sector are included in the mentioned category. These sources are as follows:

3C1. Biomass burning (applies to all soil types)
3C2. Liming
3C3. Urea application
3C4. Direct N_2O emission from managed soils
3C5. indirect N_2O emission from managed soils
3C6. Indirect N_2O emissions from manure management
3C7. Rice cultivation
3C8. Other sources

In addition, category 3.D – Other comprises the following sources:

3.D.1. Harvested Wood Products (HWP);
3.D.2. Other sources (please specify).
GHG emissions are emitted from the sources of this category. So, mainly CO_2 gas is emitted into the atmosphere depending on the combustion process and other management conditions. However, since these combustion processes arise in disorganized sources, gases other than CO_2, i.e. CH_4, N_2O, NOx, CO, SO_2 and other gases are emitted into the atmosphere since complete combustion does not occur in them. Two of those gases (CH_4, N_2O) are gases that produce a direct thermal effect. The rest ones indirectly create a thermal effect. Various GHG emissions also arise from other land management.

Formation of the afore-mentioned gases occurs mainly from the combustion process. In general, combustion processes in soils occur for natural and anthropogenic reasons. Natural burns are caused by lightning, volcanic activity, while anthropogenic burns are caused by human activity, that is, can occur as a result of direct arson, recklessness (leaving a bonfire burning, etc.).

3C1. Biomass burning. In general, waste burning in areas of agricultural lands and forests is prohibited by law. Combustion processes in the territory of Azerbaijan usually occur in forests. Data on the scale of forest fires in 1990-2024 and the resulting direct GHG emissions into the atmosphere are given in the table below.

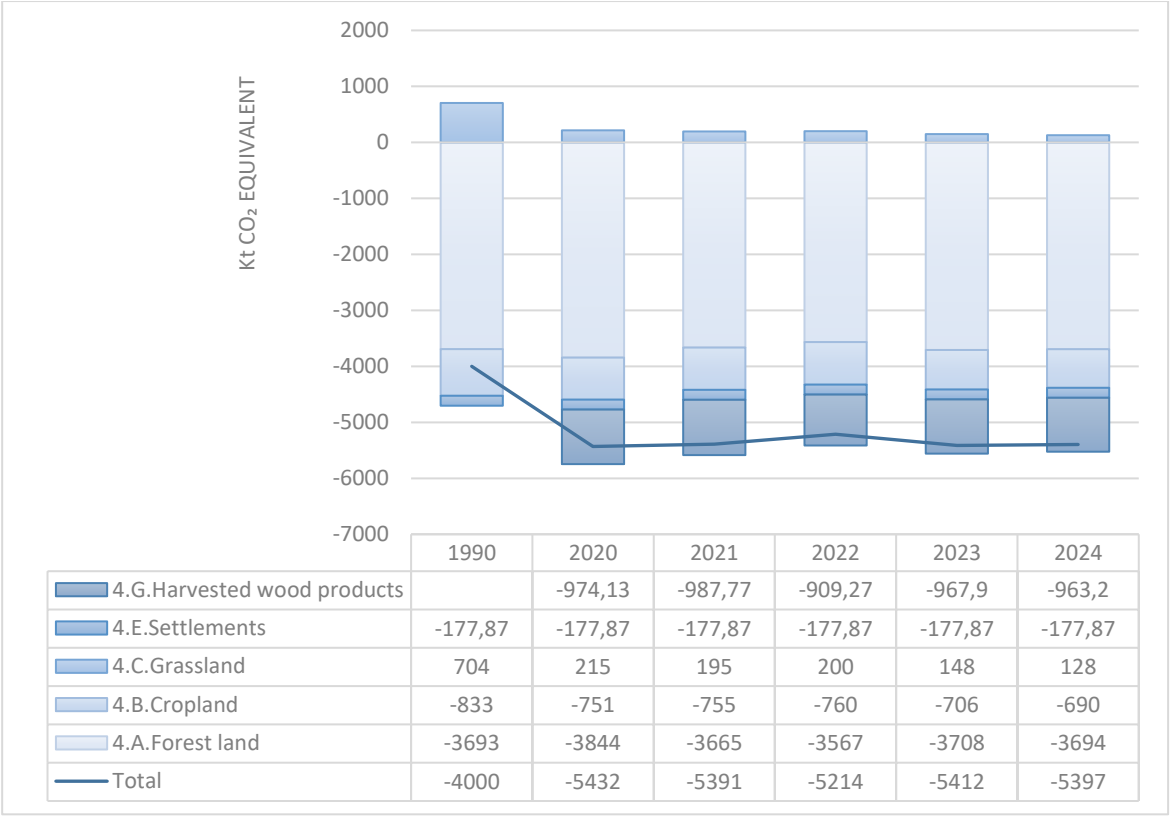
Direct GHG	1990	2020	2021	2022	2023	2024	1990-2024, difference, %
Burning territory, ha	186	48	380.1	869.2	25.3	14.7	-92.1
CH_4	0.014	0.011	0.09	0.21	0.01	0.004	-71.43
N_2O	0.0008	0.0006	0.004	0.01	0.0003	0.0002	-75
Total	0.604	0.467	3.58	8.53	0.36	0.165	-72.68

Table 17. Direct GHG emissions from forest fires, kt CO_2 eq.

Precursor gases are also emitted into the atmosphere during the forest fires. Their volume is very small.

2.1.4.2. RECENT TREND IN LULUCF SECTOR

In Azerbaijan, the LULUCF sector has historically been characterized by carbon removals, with forests playing a crucial role in carbon sequestration. However, recent trends indicate a decrease in net removals by 2024. This decline is mainly attributed to the expansion of settlements at the expense of arable land and changes in land use related to the development of agriculture.



	1990	2020	2021	2022	2023	2024
4.G.Harvested wood products		-974,13	-987,77	-909,27	-967,9	-963,2
4.E.Settlements	-177,87	-177,87	-177,87	-177,87	-177,87	-177,87
4.C.Grassland	704	215	195	200	148	128
4.B.Cropland	-833	-751	-755	-760	-706	-690
4.A.Forest land	-3693	-3844	-3665	-3567	-3708	-3694
Total	-4000	-5432	-5391	-5214	-5412	-5397

Figure 27. Carbon emissions and removals from the LULUCF Sector

- **1990:** - 3,999.89 kt CO_2 eq. (sink)
- **2024:** - 4,434.25kt CO_2 eq. (sink)
- **Change:** The volume of removals has increased by 10.9% (excluding HWP[5]).

Trend: Despite the recent increase in carbon emissions from lands, removals have continued to rise. This increase is primarily attributed to the forest area, croplands, and settlements categories. Emissions exceeding carbon removals occurred only in grasslands. Since there is no data available for the base year of 1990, removals in the category of harvested wood products were not calculated, and therefore, this category is not considered in the comparison with removals in 2024.

[5] HWP was not estimated (NE) for 1990 and is therefore excluded from the comparison with the base year.

2.1.4.2.1. FOREST LANDS (4.A)

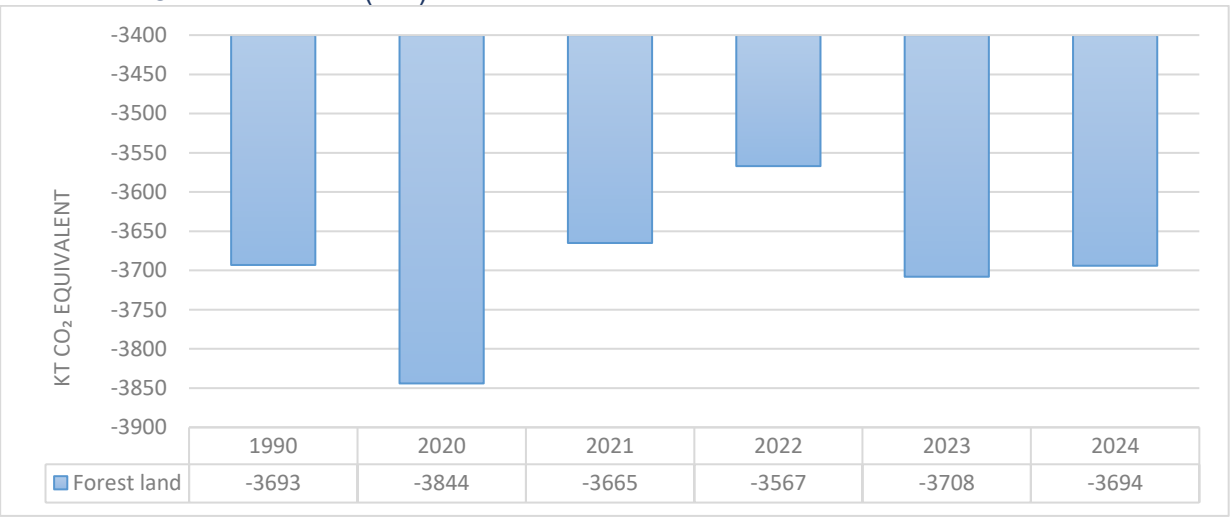


Figure 28. Carbon removals from the Forest land

- **1990:** -3,693kt CO_2 eq.(sink)
- **2024:** -3,694kt CO_2 eq. (sink)
- **Change:** Decline of 0.3% in sink capacity

Trend: It should be noted that although the volume of removals in 2020 was higher than in 1990, in recent reporting years, net CO_2 removals from Forest Land fluctuated, declining in 2021 and 2022 before recovering in 2023 and slightly decreasing in 2024. In 2024, removals were broadly at the 1990 level, despite the increase in forest area from 1,038.8 kha to 1,042.1 kha. These fluctuations primarily reflect changes in carbon stocks in living biomass and mineral soils. Emissions of CH_4 and N_2O from forest fires are reported separately under category 3.C.1 and are therefore not directly included in the Forest Land CO_2 balance presented here.

2.1.4.2.2. CROPLAND (4.B)

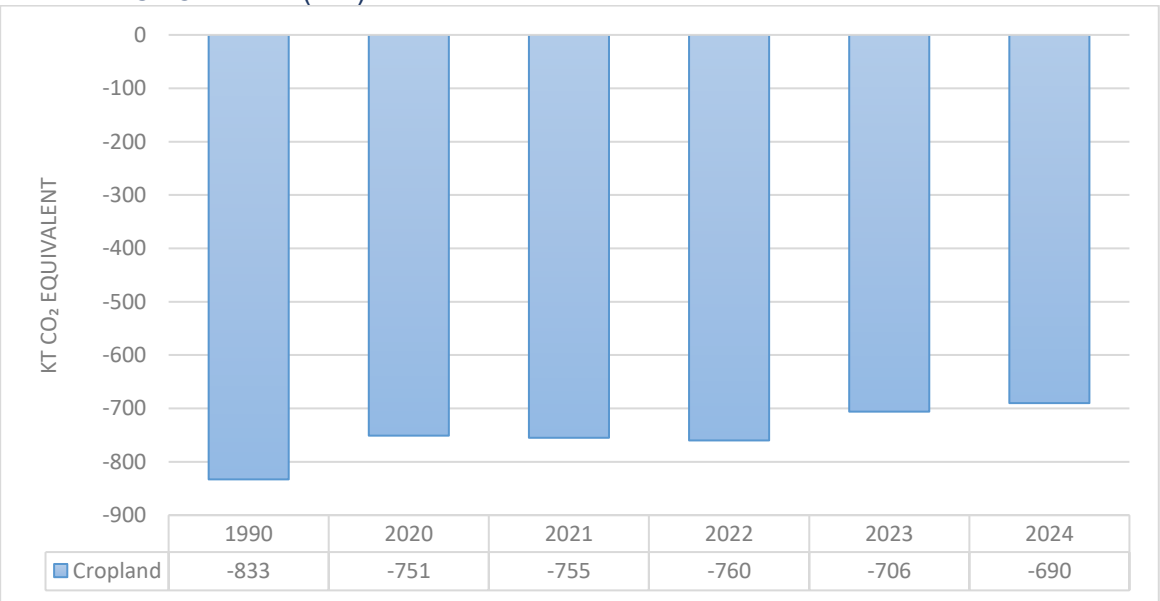


Figure 29. Carbon removals from the Cropland

- **1990:** -832.98 kt CO_2 eq.(sink)
- **2024:** -690.11kt CO_2 eq. (sink)
- **Change:** 17.2% decrease in sink capacity

Trend: The decrease in CO_2 removals from agricultural lands is related to the reduction in the area of land available for agricultural purposes, particularly perennial crops and fallow lands. This is associated with the transfer of some of these lands to other categories.

2.1.4.2.3. GRASSLAND (4.C):

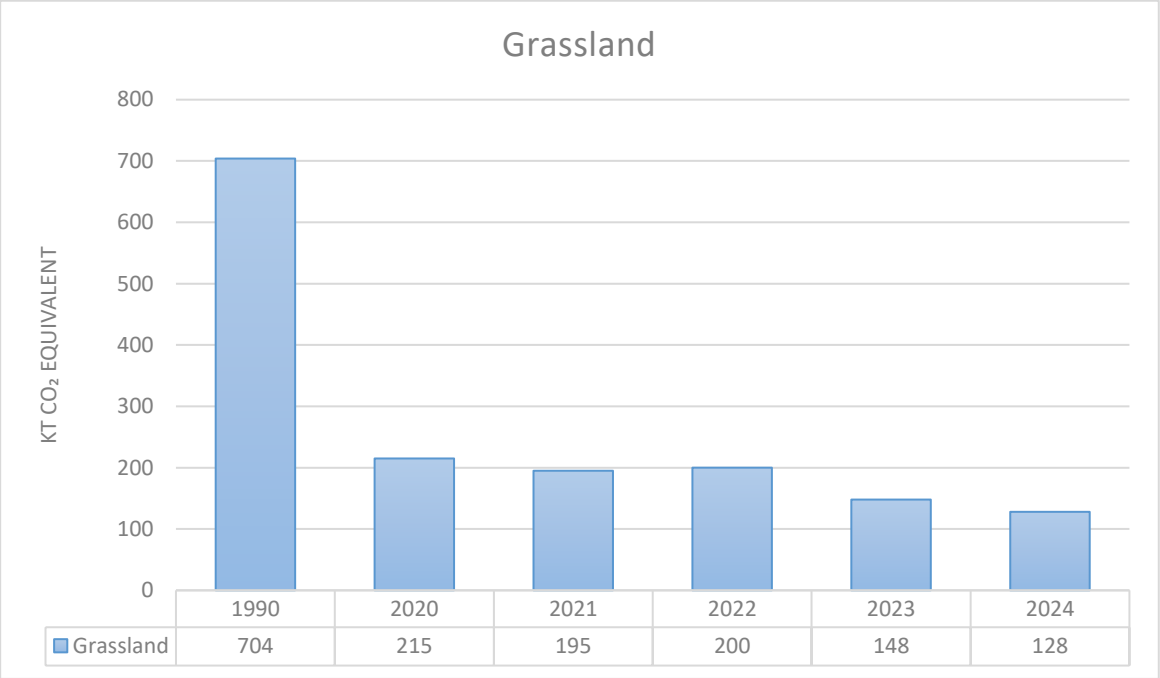


Figure 30. Carbon emissions and removals from the Grassland

- **1990:** 703.53 kt CO_2 eq.
- **2024:** 127.78kt CO_2 eq.
- **Change:** Decrease of 81.8% in sink capacity.

Trend: Despite the reduction in emissions between 1990 and 2024, emissions in the grassland category still exceed removals, primarily due to soil degradation caused by overgrazing and the conversion of grasslands to agricultural and urban land use.

2.1.5. Waste sector

2.1.5.1. HISTORICAL TREND IN WASTE SECTOR

Waste is one of the sectors covered by the 2006 IPCC Guidelines. The main greenhouse gases (GHGs) emitted from this sector are methane (CH_4), carbon dioxide (CO_2) and nitrous oxide (N_2O). The categories of the sector are as follows:

4A. Solid waste disposal;

4B. Biological treatment of solid waste;

4C. Incineration and open burning of waste;4D. Wastewater treatment and discharge;

4E. Others.

Waste management in Azerbaijan remains uneven. The management of domestic and industrial waste is more developed in Baku than in other cities, districts and settlements. Gaps in waste collection, treatment and disposal infrastructure outside the capital contribute to emissions from the Waste sector. Open burning of waste is prohibited under national environmental legislation. However, organized waste incineration takes place at the Baku Solid Waste Incineration Plant. Article 271 of the Administrative Offences Code provides for fines of up to 8,000 manats for violations of environmental requirements related to waste disposal and incineration. As the population and the number of industrial enterprises grow, the amount of waste generated also tends to increase. The resulting increase in waste generation may contribute to higher GHG emissions, particularly where waste is disposed of without adequate treatment. **4A. Solid Waste**. The sources of the category of disposal of solid waste are solid waste landfills, official and unofficial landfills. During the collection and removal of industrial and solid household waste in cities, methane emissions are mainly caused by the waste decay in landfills and dumpsites.

The quantitative and qualitative composition of biogas generated at the disposal landfill of solid waste depends on the climatic and geological conditions of the landfill, morphological and chemical composition of waste, its density, storage conditions (area, volume, density), humidity and other factors. The gas produced in landfills is the product of biological separation of the organic fraction of the stored waste. The source of biogas is food waste, waste from gardens and parks, waste paper and other pulp-containing waste. On average, 60-80% of solid waste masses are biodegradable waste fractions. The amount of methane from these sources was calculated using the “IPCC_WASTE_MODEL” software.

1. Solid waste management has become one of the most acute economic and environmental issues in the country. For the purposes of national activity-data compilation, solid waste is distinguished into two groups:solid household waste (4A1);
2. solid industrial waste (4A2).

4B. Biological processing of solid waste. In Azerbaijan, until the middle of the last century, waste was thrown on empty places. After 1950, the collection of waste in large cities and its placement in landfills by transport began to be managed. For the first time in the country, a waste landfill was created in the Balakhani settlement of Baku. After the problem of global climate change occurred, appropriate works began to be carried out to control the gases that create a thermal effect in waste landfills.

For this purpose, “solid waste sorting” plant was established on the basis of Balakhani landfill and its surrounding area. The solid waste sorting plant was built in order to develop the field of recycling in the country. The plant with an annual capacity of 200 thousand tons was built based on advanced German technologies. As a result of sorting, paper, glass, plastic, non-ferrous metals, iron and other raw materials suitable for recycling are allocated, as a result of which the total volume of waste is reduced, the market of cheap raw materials is formed, the foundation for recycling is created in the country, energy is saved, and most importantly - the negative impact of waste on the environment is reduced. In addition, hazardous waste such as batteries and accumulators generated in the household, including electronic waste of this kind, are separated from the general mass and sent to the relevant places for proper disposal. A technical park was created near the plant to use the sorted waste as raw materials. At enterprises in technical park, paper and scrap, plastics, processed oils and others sorted from the waste are used as raw materials.

4C. Incineration and open burning of waste. Open burning of any waste in the Republic of Azerbaijan is prohibited by law. Therefore, in order to manage waste in an organized manner, a plant was built near the Balakhani landfill. Baku solid waste incineration plant is the only plant built within the framework of the "Comprehensive Action Plan for improving the environmental situation in the Republic of Azerbaijan for 2006-2010". The annual capacity of the plant built in Balakhani settlement is 500 thousand tons of household waste, including 10 thousand tons of medical waste. As a result of the waste incineration process, the plant is capable of producing up to 231.5 million kW/h of electricity per year.

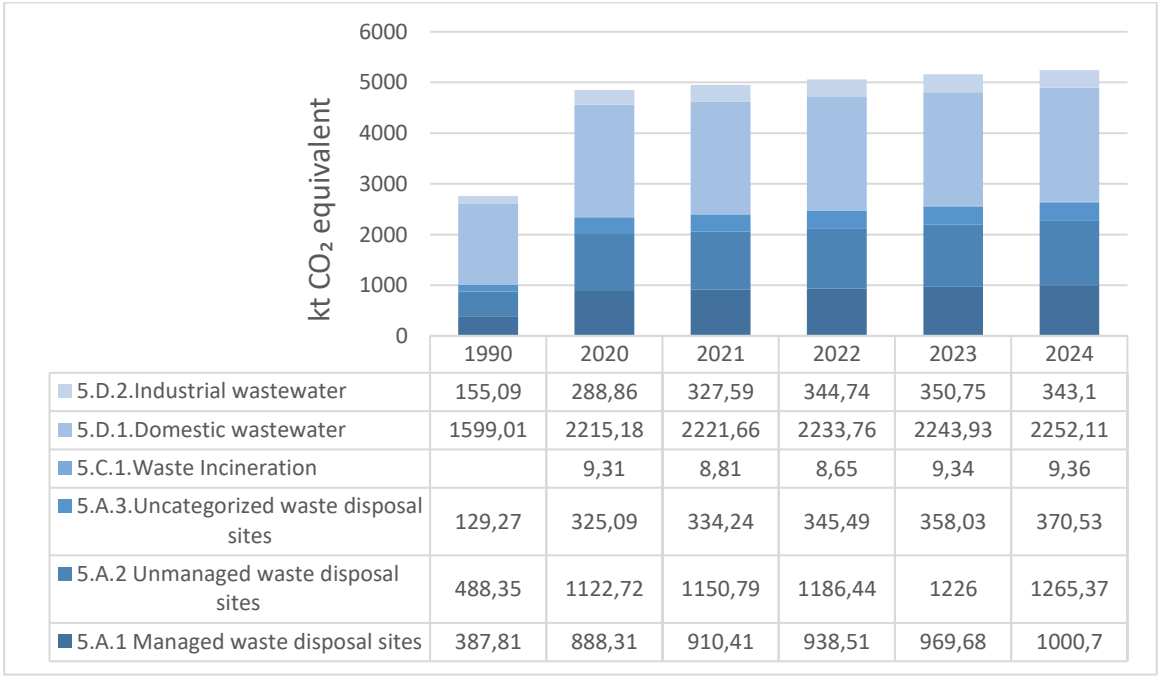
4D. Wastewater treatment and discharge. Household and industrial wastewater is discharged through sewage systems into the appropriate reservoirs.

Wastewater can generate CH_4 when treated or discharged under anaerobic conditions and can also be a source of N_2O emissions. CO_2 emissions from wastewater are not included in the national total in accordance with the 2006 IPCC Guidelines, as they are considered to be of biogenic origin. In some residential areas, wastewater is discharged through sewage systems directly into receiving water bodies, including basins, rivers, lakes and the sea, without adequate treatment.Sewage collectors in Baku and other major cities and regions of Azerbaijan are usually closed and placed underground. In accordance with the 2006 IPCC Guidelines, wastewater in closed underground sewers is not considered to be a significant source of CH_4 emissions.

2.1.5.2. CURRENT TREND IN WASTE SECTOR

Significant growth in emissions has been observed in Azerbaijan's waste sector from 1990 to 2024, primarily due to solid waste disposal and wastewater treatment. This increase reflects Azerbaijan's growing population and urbanization, leading to a rise in waste volumes. Total GHG emissions from the Waste sector increased from 2,759.53 kt CO_2 eq. in 1990 to 5,241.19 kt CO_2 eq. in 2024, representing an increase of 89.9%.

Managed and unmanaged landfill sites contribute substantially to emissions, while domestic wastewater is a notable source of methane (CH_4) and nitrous oxide (N_2O). The sector's emissions highlight the need for improved waste management systems and sustainable waste treatment solutions to mitigate its environmental impact.



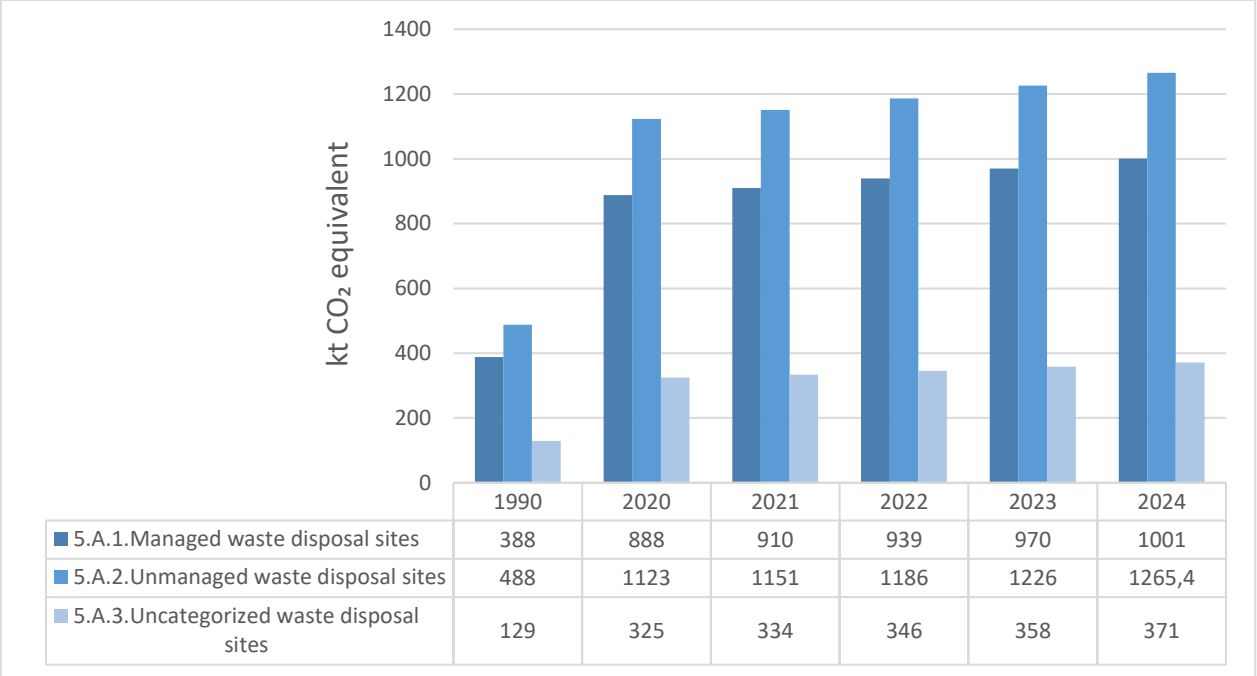
	1990	2020	2021	2022	2023	2024
5.D.2.Industrial wastewater	155,09	288,86	327,59	344,74	350,75	343,1
5.D.1.Domestic wastewater	1599,01	2215,18	2221,66	2233,76	2243,93	2252,11
5.C.1.Waste Incineration		9,31	8,81	8,65	9,34	9,36
5.A.3.Uncategorized waste disposal sites	129,27	325,09	334,24	345,49	358,03	370,53
5.A.2 Unmanaged waste disposal sites	488,35	1122,72	1150,79	1186,44	1226	1265,37
5.A.1 Managed waste disposal sites	387,81	888,31	910,41	938,51	969,68	1000,7

Figure 31. GHG emissions from the Waste sector

- **1990:** 2,759.53 kt CO_2 eq.
- **2024:** 5,241.2 kt CO_2 eq.
- **Change:** Increase of 89.9%.

Trend: The sharp increase in emissions from the waste sector is largely due to urbanization and population growth, particularly in cities like Baku. As Azerbaijan's economy has grown, the amount of solid waste generated has also increased. Waste management practices, including the use of unmanaged or categorically open waste disposal sites, have contributed to a rise in emissions, particularly methane emissions from decomposing organic waste.

2.1.5.2.1. SOLID WASTE DISPOSAL (5.A):



	1990	2020	2021	2022	2023	2024
5.A.1.Managed waste disposal sites	388	888	910	939	970	1001
5.A.2.Unmanaged waste disposal sites	488	1123	1151	1186	1226	1265,4
5.A.3.Uncategorized waste disposal sites	129	325	334	346	358	371

Figure 32. GHG emissions from the Solid Waste Disposal by site classification, kt CO_2-eq.

- **1990:** 1,005.42 kt CO_2 eq.
- **2024:** 2,636.61 kt CO_2 eq.
- **Change:** Increase of 162.2%

Trend: The increased emissions are tied to the rise in solid waste production due to economic development, but waste management infrastructure has not kept pace. Much of the waste is still disposed of in unmanaged landfills, which produce high levels of methane, exacerbating greenhouse gas emissions.

2.1.5.2.2. WASTEWATER TREATMENT AND DISCHARGE (5.D)

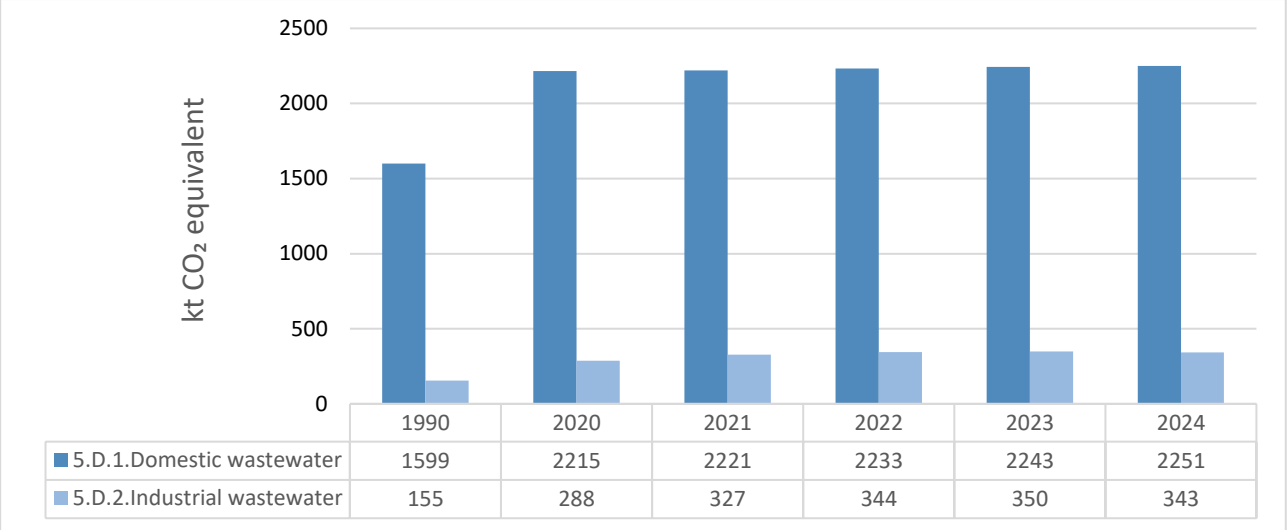


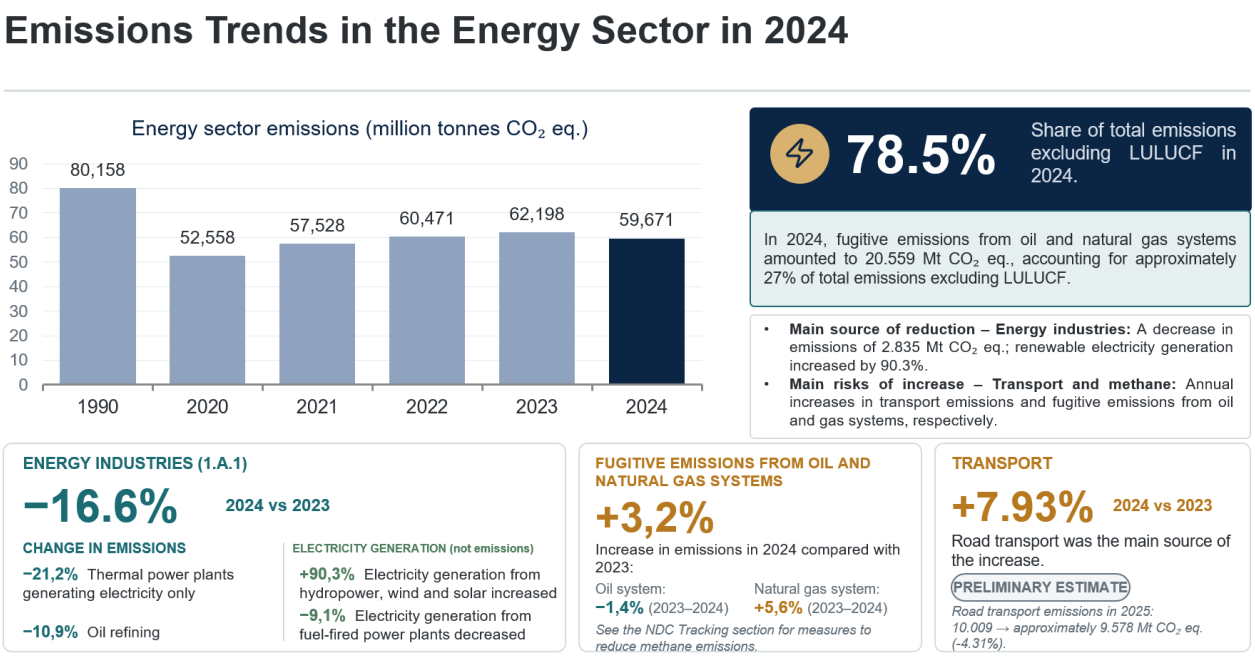
Figure 33. GHG emissions from the Wastewater Treatment and Discharge

- **1990:** 1,754 kt CO_2 eq.
- **2024:** 2,595 kt CO_2 eq.
- **Change:** 48% increase

Trend: The growth of urban populations, particularly in cities such as Baku, has increased the amount of wastewater generated. Although there have been improvements in wastewater treatment processes, the scale of growth has outpaced infrastructure upgrades, resulting in a rise in emissions, especially from domestic wastewater. Emissions increased from 2,578 kt CO_2 eq. in 2022 to 2,595 kt CO_2 eq. in 2024.

3: Energy (CRT sector 1)

3.1. Overview of the sector



3.1.1. Energy balance of Azerbaijan

The energy balance includes a system of accounting ratios for collecting and coordinating data on all energy products imported, exported and utilized in the territory of the country during a certain period.

In 2024, 88.6% of energy products with a total production volume of 74.7 million tons of oil equivalent (Mtoe) in the country were primary energy products, 7.7% were oil products, and 3.7% were heat and electricity. 45.0% of all primary energy products were crude oil (including gas condensate), 54.4% were natural gas, and 0.6% were energy products produced from renewable energy sources.

Azerbaijan is a country exporting crude oil, natural gas and oil products. In 2024, exports in the country amounted to 50.1 million tons of oil equivalent (Mtoe), 49.9% of which accounted for crude oil, 48.6% for natural gas, 1.3% for petroleum products, and 0.2% for electricity.

In 2024, Azerbaijan's energy demand (measured by total energy supply) amounted to 18.5 million tons of oil equivalent (Mtoe) (according to data from the State Statistics Committee). Azerbaijan remained a major producer of crude oil and natural gas and total domestic energy production was approximately four times higher than total energy supply.

Compared to 2023, total energy supply decreased by 2.0% and amounted to 18.5 million tons of oil equivalent (Mtoe). Processes of the transformation sector accounted for 15.8%, internal consumption of the energy sector for 4.8%, losses for 6.4% and final consumption for 72.8% of total energy supply. This decline in total energy supply was accompanied by a 4.06% decrease in total Energy-sector GHG emissions in 2024, to 59.671 Mt CO_2 eq. Energy-sector emissions nevertheless remained 25.56% below their 1990 level.

39.0% of final energy consumption fell on households, 30.8% on transport, 15.3% on industry and construction, and 14.9% on other sectors of the economy.

The latest edition of the statistical collection “Energy of Azerbaijan” presents the national energy balance and related energy statistics for 2021–2025, while the State Statistical Committee's energy-statistics database provides annual energy balances for 2007–2025. The collection consists of 5 sections. Section 1 includes the main indicators of the activities of energy enterprises, energy consumption and share of electricity in energy consumption, energy capacity, energy efficiency in industrial areas, Section 2 includes the energy balance by years and distribution of the

balance by sectors, Section 3 covers the balance of energy products (commodities) including the energy balance, Section 4 includes the consumption of energy products by the economic activity types, Section 5 covers production of crude oil, natural gas, power stations capacity, information on pollutants released into the atmosphere by enterprises operating in separate sectors of the economy.

The current energy balance is compiled in accordance with the UN International Recommendations for Energy Statistics (IRES), developed with the involvement of the UN, the International Energy Agency, Eurostat, the Oslo Group and other participants, and adopted at the 42nd session of the UN Statistical Commission in February 2011.

3.1.1.1 STRUCTURE OF ENERGY BALANCE

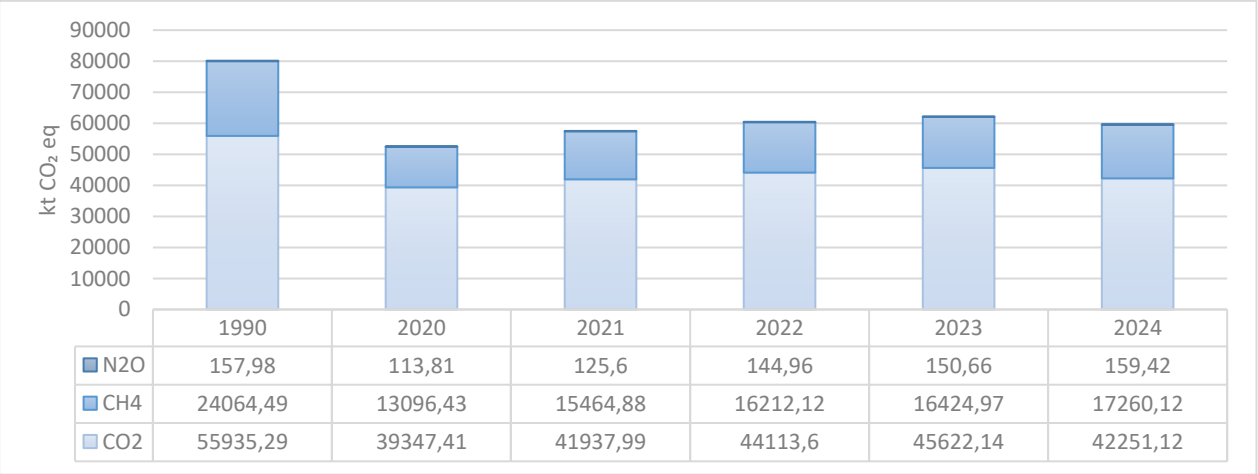
The energy balance is a complex aggregate expressed in a common energy unit of a tonne of oil equivalent (toe/NET), combining the balances of individual energy products (crude oil, natural gas, electricity and etc.). 1 NET is equal to 41.868 gigajoules (GJ) , or 0.041868 terajoules (TJ) , while 1 TJ is equal to 1,000 GJ. The development of energy balance is preceded by the development of commodity balances of all energy products specified in the balance sheet. The energy balance consists of 50 rows and 23 columns in the form of a matrix. The rows indicate the flows of energy from the place of its formation to the place of its final use, and the columns indicate energy products. The model of the National Energy Balance of Azerbaijan is based on the UN "International Recommendations on Energy Statistics" (IRES) and the unified structure of energy balances, considering the local features.

3.2. Overview of GHG emissions of the sector

The energy sector is the main source of anthropogenic GHG emissions in Azerbaijan. The energy sector in total greenhouse gas emissions (excluding LUCLUF) for 2024 has the largest share amounted to 78.5%.

CO_2 remained the dominant greenhouse gas emitted by the Energy sector. In 2024, Energy-sector CO_2 emissions amounted to 42,251.12 kt CO_2 eq, CH_4 emissions to 17,260.12 kt CO_2 eq, and N_2O emissions to 159.42 kt CO_2 eq. In terms of the composition of total Energy-sector GHG emissions, CO_2 accounted for approximately 70.81%, CH_4 for 28.93%, and N_2O for 0.27%.

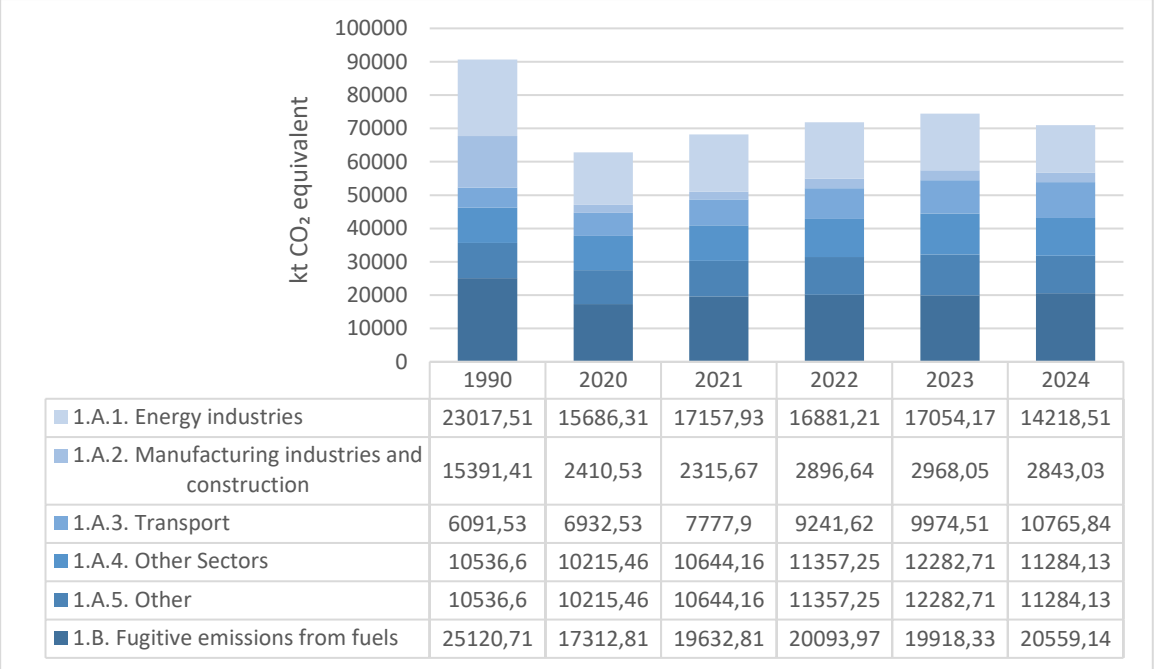
At the national level, the Energy sector was responsible for approximately 91.9% of total national CO_2 emissions, 62.4% of total national CH_4 emissions, and 10.4% of total national N_2O emissions in 2024.



	1990	2020	2021	2022	2023	2024
N2O	157,98	113,81	125,6	144,96	150,66	159,42
CH4	24064,49	13096,43	15464,88	16212,12	16424,97	17260,12
CO2	55935,29	39347,41	41937,99	44113,6	45622,14	42251,12

Figure 34. GHG emissions by gases in Energy sector

GHG emissions in the energy sector are primarily CO_2 generated as a result of energy production (1.A.1), processing industry and construction (1.A.2), transport (1.A.3) and combustion of residual fuels in other sectors (1.A.4).



	1990	2020	2021	2022	2023	2024
1.A.1. Energy industries	23017,51	15686,31	17157,93	16881,21	17054,17	14218,51
1.A.2. Manufacturing industries and construction	15391,41	2410,53	2315,67	2896,64	2968,05	2843,03
1.A.3. Transport	6091,53	6932,53	7777,9	9241,62	9974,51	10765,84
1.A.4. Other Sectors	10536,6	10215,46	10644,16	11357,25	12282,71	11284,13
1.A.5. Other	10536,6	10215,46	10644,16	11357,25	12282,71	11284,13
1.B. Fugitive emissions from fuels	25120,71	17312,81	19632,81	20093,97	19918,33	20559,14

Figure 35. GHG emissions in Energy sector

Figure 35 shows that the emissions of the energy sector have decreased by 25.56% since 1990. The reduction in emissions can primarily be attributed to the transition from carbon-intensive fossil fuels, including residual fuel oil, toward greater use of natural gas in electricity and heat production, together with improvements in energy efficiency and modernization of energy infrastructure. More recently, total Energy-sector emissions increased from 52,557.64 kt CO_2 eq in 2020 to 62,197.76 kt CO_2 eq in 2023, before decreasing by 4.06% in 2024 to 59,670.66 kt CO_2 eq. The 2024 decrease was driven mainly by reductions in Energy Industries (1.A.1), Other Sectors (1.A.4), and Manufacturing Industries and Construction (1.A.2), while Transport (1.A.3) emissions increased by 7.93% and Fugitive Emissions from Fuels (1.B) increased by approximately 3.22% compared with 2023. Emissions from combustion activities in the energy sector are calculated using fuel-consumption data from the State Statistical Committee (SSC), supplemented, where applicable, by data from relevant energy-sector operators, including SOCAR. Fuel consumption is converted to energy units using net calorific values, and CO_2 emissions are estimated using the corresponding carbon-content and oxidation factors in accordance with the 2006 IPCC Guidelines.

Fugitive emissions from oil and natural gas activities are estimated using activity data on oil and natural gas production, processing, transmission, distribution, storage and flaring provided by the SSC and relevant operators, including SOCAR and BP Azerbaijan. The calculations apply Tier 1 methods of the 2006 IPCC Guidelines and, where applicable, relevant methodological refinements and emission factors from the 2019 Refinement.

In accordance with the ETF reporting requirements, the current inventory applies 100-year GWP values from the IPCC Fifth Assessment Report (AR5), consistent with Azerbaijan's BTR1.Total emissions from the energy sector for 2024 amounted to 59,670.66 kt CO_2 eq. Fuel Combustion Activities (1.A) accounted for 39,111.52 kt CO_2 eq, or approximately 65.55% of total Energy-sector emissions. Energy Industries (1.A.1) accounted for approximately 23.83% of total Energy-sector emissions.

3.2.1.Fuel combustion (1.A)

Fuel combustion category in the energy sector of the country covers all the areas of human activity. Since no restrictions apply to the statistical collection of data on these areas, this category also includes areas such as residential and commercial/institutional. At the same time, oil and gas are combusted in the country in the processes of production and processing of oil and gas. In the latest inventory year of 2024, emissions from Fuel Combustion Activities (1.A) amounted to 39,111.52 kt CO_2 eq, compared with 55,037.05 kt CO_2 eq in 1990, representing a reduction of 28.94%. Natural gas remained the dominant fuel used in stationary combustion, while liquid fuels continued to be

used particularly in transport and, to a lesser extent, in energy and industrial activities. This category includes stations that provide electricity and thermal energy, and enterprises that produce industrial products. The energy balance includes information on the fuel supplied to the stations generating electric and thermal energy. To protect confidential business and military information, a minimum level of collection was carried out and open data of the SSC was used.

Between 2020 and 2023, emissions from Fuel Combustion Activities increased from 35,244.83 kt CO_2 eq to 42,279.43 kt CO_2 eq, an increase of approximately 19.96%. This trend reversed in 2024, when emissions decreased by 7.49% compared with 2023, reaching 39,111.52 kt CO_2 eq. The decrease was driven primarily by Energy Industries (1.A.1), where emissions declined by 16.63%, together with decreases of 8.13% in Other Sectors (1.A.4) and 4.21% in Manufacturing Industries and Construction (1.A.2). By contrast, Transport (1.A.3) emissions increased by 7.93%.

3.2.1.1. FUEL COMBUSTION IN THE PRODUCTION OF ELECTRICITY.

1.A.1. of the 1.A(a) Table of CRT The amount of fuel combusted at power stations operating based on fuel in the Electric Power Generation section is given in TJ. As can be seen from Table 1A(a) of CRT, in 2024, 210,326.3 TJ of natural gas and 747.5 TJ of diesel fuel were used in the processes of electricity generation at thermal power stations in Azerbaijan. Of this amount, electricity-generating power stations and combined heat and power plants accounted for 201,795.6 TJ of natural gas and 734.5 TJ of diesel fuel.

As a result of waste burning at the Baku Solid Waste Incineration Plant in Balakhani, Tamiz Shahar OJSC produces more than 200 million kWh of electricity per year, which is transmitted to the general network of Baku city.

3.2.2. Verification of the sectoral approach for CRT 1.A

3.2.2.1. COMPARISON OF THE SECTORAL APPROACH WITH THE REFERENCE APPROACH

Report on CO_2 emissions related to fuel combustion is of paramount importance in the context of international climate protection, since such emissions make up the bulk of total emissions. To this end, countries apply a sectoral approach that allows diversity in the analysis of emission structures, appealing to the level of energy consumption of individual sectors.

"Sectoral approach" (1.AA) is the calculation of CO_2 emission by multiplying the amount of fuel consumed in the sectors by the emission ratio.

"Reference approach" (1.AB) is the calculation of CO_2 emission using the flow of all total fuel in the country (data on production, imports, exports, international bunkers and stock changes, as reflected in the national energy balance) (IPCC 2006 Guidelines, Vol.2, Chapter 6).

In accordance with the IPCC 2006 Guidelines, the carbon emission factors used are equivalent to those of the sectoral approach and thus, contain values referenced at the national level. Calculated CO_2 emission data is used to verify the sectoral approach.

CO2 emissions from fuel combustion of the energy sector are compared using the sectoral approach (SA) and the reference approach (RA). As mentioned, SA is a "bottom-up" approach method in assessing CO_2 emissions, while RA is a “top-down” approach in assessing CO_2 emissions using the National fuel statistics.

These values for CO2 emissions from fuel combustion in Azerbaijan are based on the data provided by the SSC, the bottom-up activity data, which presents the annual consumption of primary and secondary fuel in various economic sectors, as well as data on the non-energy use of various types of fuel. The Reference Approach uses the supply-side data of the national energy balance, including fuel production, imports, exports, international bunkers and stock changes, while non-energy final consumption is used for the estimation of excluded carbon. The stock-change values reported in the SSC energy balance are converted to the IPCC Reference Approach sign convention, as the SSC and IPCC use opposite conventions for stock changes.

The difference between SA and RA arises, first of all, from the statistical differences between production and demand within the National Energy Statistics, statistical differences between fuel estimates, underestimation of fuel used for non-energy purposes, “other types of fuel” in National

Statistics, as well as from more general approaches to the application of emission factors to the activity data on fuel types.

	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024
RA (kt CO_2)	57,138.8	37,484.27	32,065.58	35,839.05	29,209.25	36,236.78	36,843.38	38,828.13	41,239.41	41,923.38	41,362.56
SA (kt CO_2)	54,749.69	33,823.62	28,747.44	33,782.24	25,911.82	33,803.35	35,042.10	37,670.36	40,125.57	42,016.78	38,840.89
Difference CO_2 emissions (%)	4.36	10.82	11.54	6.09	12.73	7.2	5.14	3.07	2.78	-0.22	6.49

Table 18. Comparison of RA and SA in terms of CO_2 emissions

Difference between the reference approach and the sectoral approach to CO_2 estimations for Azerbaijan was 4.4% in 1990., however in 2022 this figure decreased to 2.78%. For the most recent inventory years, the difference amounted to 5.14% in 2020, 3.07% in 2021, 2.78% in 2022 and -0.22% in 2023, indicating close agreement between the two approaches in these years. In 2024, the difference increased to 6.49%.

The higher difference in 2024 is subject to further reconciliation and does not necessarily indicate an error in either approach. QA/QC against the national energy balance confirmed that the 2024 Reference Approach supply-side calculations are consistent with the SSC energy balance.

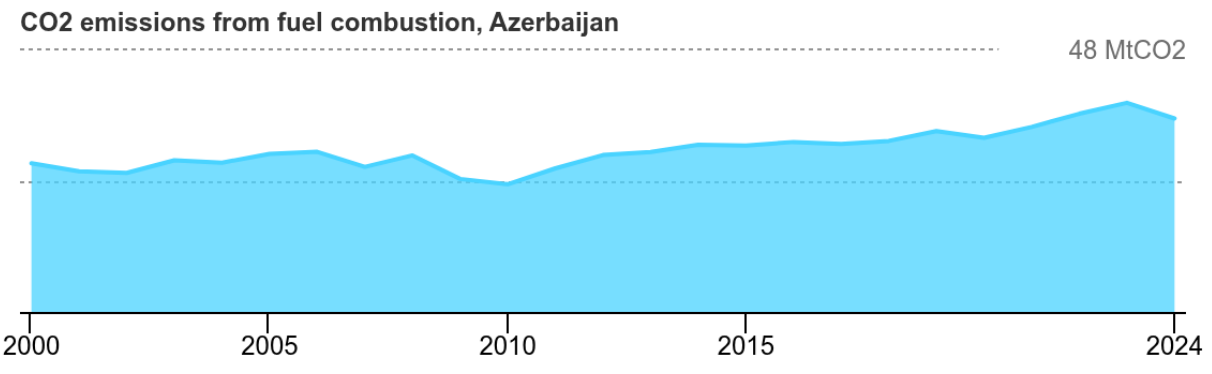
More information on the RA, SA and RA-SA comparison can be found in CRT Table 1.A(b), Table 1.A(c) and Table 1.A(d).

3.2.2.2. COMPARISON WITH OTHER SOURCES OF INFORMATION AVAILABLE FOR AZERBAIJAN

In accordance with the provisions of the IPCC 2006 Guidelines, the results of detailed sectoral calculations of energy-related CO_2 emissions should be compared with any other sources of information available by the reporting country.

When calculating CO_2 emissions from fuel combustion within the framework of such an inspection, the International Energy Agency's (IEA) Greenhouse Gas Emissions from Energy database, formerly published as CO2 Emissions from Fuel Combustion, was used as an independent source for comparison. The latest edition of the database was updated in July 2026 and includes country-level data through 2024.

According to the IEA's Global Energy Review 2026, global energy-related CO2 emissions increased by around 0.4%, or approximately 145 Mt CO2, in 2025, reaching a new high of nearly 38.4 Gt CO2. CO2 emissions from fuel combustion increased by close to 0.5%, or around 185 Mt CO2, while emissions from industrial processes decreased by around 2%, or approximately 40 Mt CO2.



Source: International Energy Agency. Licence: CC BY 4.0

Figure 36. CO_2 emissions from fuel combustion, IEA

The IEA's assessment of CO_2 emissions from fuel combustion in Azerbaijan shows emissions of approximately 36 Mt CO2 in 2022, 38 Mt CO2 in 2023 and 36 Mt CO2 in 2024. Over the same years, the latest national inventory estimates under the Sectoral Approach amount to 40.13 Mt CO2 in 2022, 42.02 Mt CO2 in 2023 and 38.84 Mt CO2 in 2024, respectively. The national inventory estimates are therefore higher than the corresponding IEA estimates by approximately 4.13 Mt CO2 in 2022, 4.02 Mt CO2 in 2023 and 2.84 Mt CO2 in 2024. Based on the rounded IEA values presented in the Data Explorer, this corresponds to differences of approximately 11.5%, 10.6% and 7.9%, respectively, relative to the IEA estimates.

The comparative data is developed and published by the IEA. It does not fully match the national inventory estimates, as the IEA applies its own harmonised international energy balances, methodological assumptions and emission factors, whereas the national inventory is based on the latest activity data collected, processed and provided by the relevant institutions in Azerbaijan and compiled in accordance with the national GHG inventory framework.Despite a number of methodological limitations, the comparison the comparison with the latest IEA data shows that the results are broadly consistent in terms of both magnitude and trend. For the most recent inventory years, the difference is approximately 8–12%, with the discrepancy narrowing in 2024. Comparable national emissions in 2022–2024 remain higher than the corresponding IEA estimates; however, both datasets show a similar recent trend, with emissions increasing between 2022 and 2023 and decreasing in 2024. 3.2.3 CO_2 emissions as a result of non-energy (non-energy-related) use of fuel

The vast majority of oil and gas used by Azerbaijan is used for energy-related purposes. However, part of these fuels is also used as raw material for non-energy-related production processes. In the energy balance of Azerbaijan (EB), this consumption, which is not related to energy, is mentioned separately in line 50. The main consumer that dominates in this area is the chemical industry, and the most important derivative products include ethylene and methanol.

Bitumen and lubricants, on the other hand, are produced at oil refineries. Applications for bitumen include the production of road covering and roofing, while lubricants are used in transport vehicles and various other types of machinery.

CO_2 generated from energy substances used for non-energy purposes and other GHG emissions are calculated in the respective sector categories.

Table 19 reflects data on substances used for non-energy purposes for 2024.

Fuel	Estimated Quantities (TJ)	Conversion Factor (TJ/Unit)	Estimated Quantities (TJ)	Carbon content (t C/TJ)	Excluded Carbon (Gg C)
Bitumen	11,055.9	1	10,735	22	243.23
Gas/Diesel Oil	151.2	1	490.6	20.2	3.05
Liquefied Petroleum Gases	9,668.3	1	10,936.2	17.2	166.29
Lubricants	4,580.8	1	3,452.6	20	91.62
Naphtha	8,787.6	1	11,026.2	20	175.75
Other Petroleum Products	14,449.5	1	27,010.4	20	288.99
Petroleum Coke	94.7	1	123.1	26.6	2.52
Refinery Gas	1,665.8	1	2,090.8	15.7	26.15
Residual Fuel Oil		1	8.5	21.1	
Natural Gas (Dry)	27,967	1	29,052.8	15.3	427.9

Table 19. Fuels used for non-energy purposes (without combustion) (2024)

It should also be noted that there is no detailed information on the production of such products as White alcohol and SBP, Orimulsion, paraffin waxes and other by-products of the petrochemical industry. The non-use of such products in the industry for non-energy purposes also leads to an increase in the difference between RA and SA.

3.2.4 International bunker fuels

3.2.4.1 EMISSIONS FROM INTERNATIONAL TRANSPORTATION (1.D.1.A / 1.D.1.B)

International transportation comprises two categories reported as international bunker fuels:

- 1.D.1.a – International aviation (aviation bunkers), corresponding to IPCC Software category 1.A.3.a.i – International Aviation (International Bunkers); and
- 1.D.1.b – International navigation (marine bunkers), corresponding to IPCC Software category 1.A.3.d.i – International water-borne navigation (International Bunkers).

In accordance with the 2006 IPCC Guidelines, emissions from international aviation and international navigation are estimated and reported separately as memo items and are not included in the national GHG emission totals. Activity data for both categories are obtained from the national energy balance and official energy statistics of the State Statistical Committee (SSC), while default emission factors from the 2006 IPCC Guidelines are applied.

The updated estimates for selected years are presented below. The estimates for 1990 and 2020–2024 reflect the latest BTR2 inventory calculations. Values for 1995–2015 are retained from the existing historical inventory series.

	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024
International Bunkers	**1,295**	**317.41**	**459**	**1,221.01**	**1,454**	**984**	**1,146**	**1,391**	**1,370.5**	**1,297**	**1,335.6**
1.D.1.a. Aviation	1,057	308	305	1,123	1,220	824	1,044	1,304	1,345	1,288	1,327.3
1.D.1.b. Navigation	237	9.5	154	98	234	160	103	88	26	9.6	8.4

Table 20. GHG emissions from international bunkers, kt CO_2 eq.

3.2.4.1.1. METHODOLOGICAL ISSUES (1.D.1.A / 1.D.1.B)

Emissions from international aviation and international navigation are estimated using a Tier 1 approach, consistent with the relevant chapters of the 2006 IPCC Guidelines.

Activity data for both categories are obtained from the national energy balance and official SSC energy statistics. The estimates are based on the quantity of fuel supplied for international aviation and navigation.

Default emission factors from the 2006 IPCC Guidelines are applied as follows:

Indicators	kg CO_2 /TJ	kg CH_4 /TJ	kg N_2O /TJ
International aviation			
Jet kerosene	71,500	0.5	2
International water-borne navigation			
Gas/diesel oil	74,100	7	2
Residual fuel oil	77,400	7	2

Other petroleum products	73,300	7	2

Table 21. EF for international aviation and naval bunkers

The corresponding emission factors given in the IPCC 2006 Guidelines are selected as emission factors and the IPCC 2006 provisioning program is used. Data on activities are taken from the official energy statistics of the SSC and are based on the division of annual fuel quantities for international and domestic flights. Such divisions are obtained based on annual shares of domestic flights from the total fuel filled into the bunkers.

3.2.4.1.2. ANALYSIS OF UNCERTAINTIES (1.D.1.A / 1.D.1.B)

In the inventory trend of the countries recommended in the IPCC Guiding Principles, uncertainties for the international bunker are calculated based on the IPCC software.

In 1990 and 2024, jet fuel was used in international aviation, while fuel oil and diesel were used in international water transport in the 1990s, and only diesel in 2024.

Indicators	Gas	Uncertainty in trend in national emissions introduced by emission factor uncertainty (%)	Uncertainty in trend in national emissions introduced by activity data uncertainty (%)	Uncertainty introduced into the trend in total national emissions (%)
1.A.3.a.i - International Aviation	CO_2	0.013	0.087	0.008
1.A.3.a.i - International Aviation	CH_4	0.000	0.000	0.000
1.A.3.a.i - International Aviation	N_2O	0.000	0.000	0.000
1.A.3.d.i - International water-borne navigation	CO_2	0.014	0.002	0.000
1.A.3.d.i - International water-borne navigation	CH_4	0.000	0.000	0.000
1.A.3.d.i - International water-borne navigation	N_2O	0.000	0.000	0.000

Table 22. Uncertainties in the national GHG emissions trend

As it can be seen from the table 22, 1.A.3.a.i -uncertainty in the emission factor of the International Aviation source is 0.013%, in the activity data – 0.087% and in the trend of total CO_2 emission is 0.008%. Since the emissions of the other two gases (CH_4 and N_2O) are very small, the uncertainties of their emission factor and activity data are virtually negligible.

Similarly, 1.A.3.d.i- the uncertainty in the emission factor of international water transport is 0.014%, in activity data – 0.002% and in the general emission trend is close to zero.

3.2.4.1.3 CATEGORY-RELATED QUALITY ASSURANCE / CONTROL AND VERIFICATION (1.D.1.A / 1.D.1.B)

Quality Control and Quality Assurance were carried out by the relevant specialists in accordance with the requirements of the IPCC 2006 Guidelines and other related relevant documents.

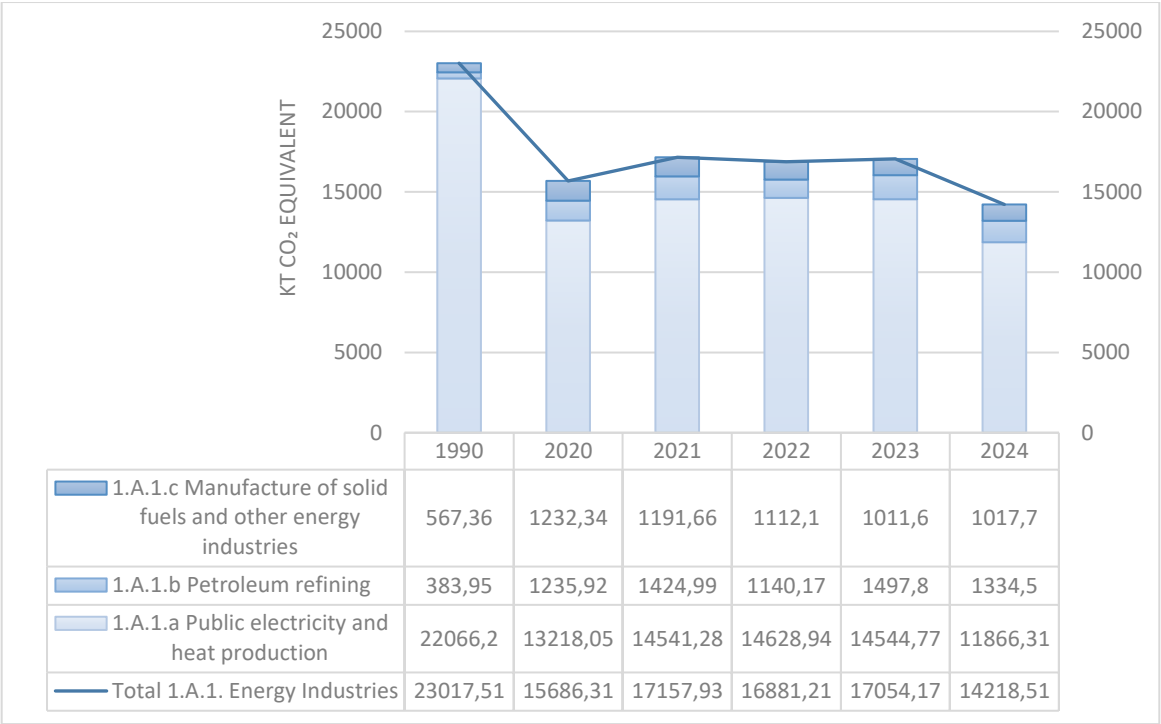
3.2.4.1.4 CATEGORY-RELATED RECALCULATIONS (1.D.1.A / 1.D.1.B)

No recalculations occurred.

3.2.5. Energy industry (Category 1.A.1)

3.2.5.1 CATEGORY DESCRIPTION

This source category includes emissions associated with electricity and thermal energy generation, oil refining, as well as oil and gas production. This category is one of the main sources of emissions in Azerbaijan. Emissions from Energy Industries (1.A.1) amounted to 23,017.51 kt CO_2 eq in 1990 and 14,218.51 kt CO_2 eq in 2024, representing a decrease of 38.23%. In 2024, Energy Industries accounted for approximately 36.35% of emissions from Fuel Combustion Activities (1.A) and 23.83% of total Energy-sector emissions.



	1990	2020	2021	2022	2023	2024
1.A.1.c Manufacture of solid fuels and other energy industries	567,36	1232,34	1191,66	1112,1	1011,6	1017,7
1.A.1.b Petroleum refining	383,95	1235,92	1424,99	1140,17	1497,8	1334,5
1.A.1.a Public electricity and heat production	22066,2	13218,05	14541,28	14628,94	14544,77	11866,31
Total 1.A.1. Energy Industries	23017,51	15686,31	17157,93	16881,21	17054,17	14218,51

Figure 37. GHG emissions in the energy industry (1.A.1)

There are several reasons for the decrease in emissions from the energy production sector since 1990:

- Power generation in the energy industry of Azerbaijan has changed from residual fuel oil burned at steam plants to gas use at combined cycle gas-turbine plants.
- Transition of the fuel mixture from more carbon-intensive fuels such as residual fuel oil to less carbon-intensive fuels such as natural gas has been ensured;
- Implementation of the oil and gas refineries modernization project ensured the increase of energy efficiency, which, in turn, led to a decrease in the emission intensity of the processing;
- The role of renewable energy sources has increased, particularly in the latest inventory year. In 2024, electricity generation from hydropower, wind and solar sources increased by approximately 91.1% compared with 2023, while generation from thermal power plants decreased by approximately 9.6%.

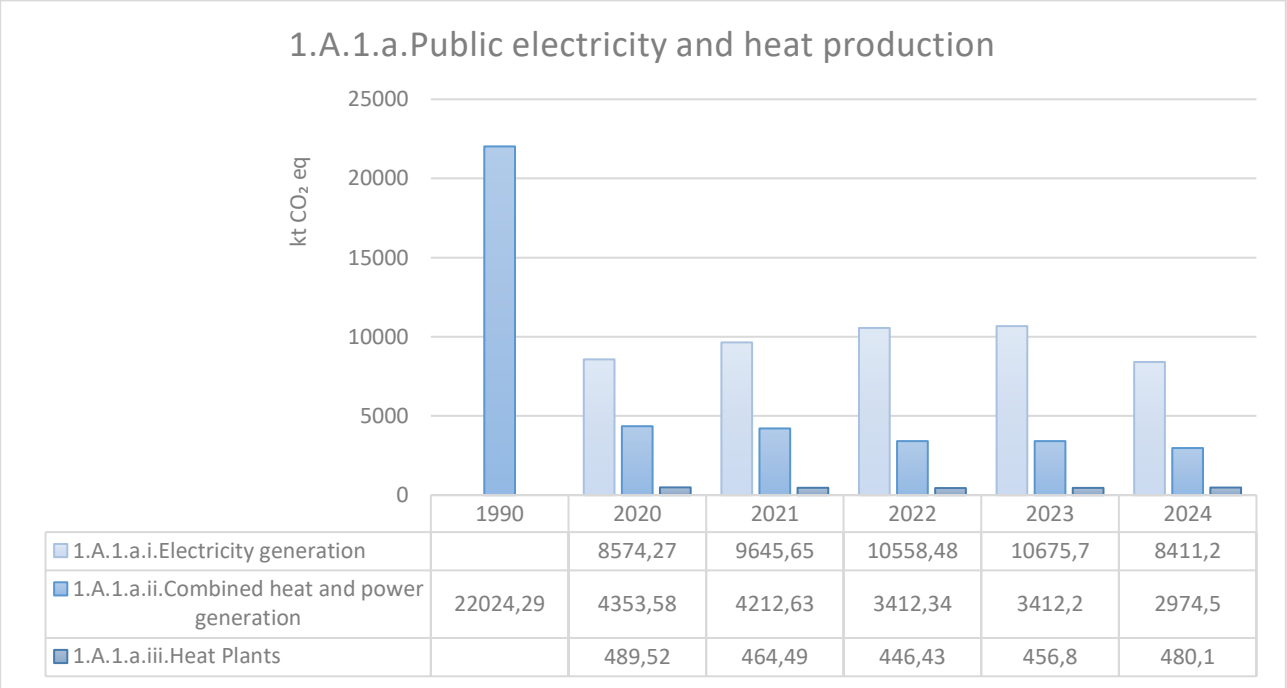
After increasing from 15,686.31 kt CO_2 eq in 2020 to 17,054.17 kt CO_2 eq in 2023, emissions from Energy Industries decreased sharply to 14,218.51 kt CO_2 eq in 2024, corresponding to a year-on-year reduction of 16.63%. The decline was driven predominantly by Public Electricity and Heat Production (1.A.1.a), reinforced by lower emissions from Petroleum Refining (1.A.1.b).

Public electricity and heat production (1.A.1.a) subcategory is the key category for CO_2 and CH_4 emissions in terms of level and trend.

"Public electricity and heat power generation" subcategory (1.A.1.a,) includes central heating plants and public power plants, which include electricity and heat generation. Installations that generate from biomass and supply electricity to the public grid also refer to Category 1.A.1. This includes electricity generation (1.A CRT Table A (a).1.a.i. Electricity generation), combustion of fuel in combined (generating both electrical and thermal energy) plants (CRT Table A(a) 1.A.1.a.ii. Combined heat and power generation) and heat plants (boilers) (CRT Table A(A) 1.A.1.a.iii. Heat plants).

In 2024, combined heat and power plants used mainly natural gas (52,953.6 TJ) and a small amount of residual fuel oil (13.0 TJ). To ensure the heat supply to population, economy and administrative buildings, numerous thermal stations (boiler houses) operate, mainly in city and regional centers, as well as in various industrial, household, tourist and other areas. Mainly natural gas (8,530.7 TJ) and partly diesel fuel (13.0 TJ) were used as fuel in these boiler houses in 2024. At the same time, it should be noted that these fuels do not include those used in autonomous combined heating systems for heating private houses, high-rise buildings being built, which significantly increases the ambiguities in this category.

The following figure shows CO_2 emissions in Category 1.A.1.a.



	1990	2020	2021	2022	2023	2024
1.A.1.a.i.Electricity generation		8574,27	9645,65	10558,48	10675,7	8411,2
1.A.1.a.ii.Combined heat and power generation	22024,29	4353,58	4212,63	3412,34	3412,2	2974,5
1.A.1.a.iii.Heat Plants		489,52	464,49	446,43	456,8	480,1

Figure 38. GHG emissions from key activities on public electricity and heat generation (1.A.1.a)

In this subcategory, emission is mainly formed from the development and structures of electricity generating facilities. GHG emissions from Public Electricity and Heat Production decreased from 22,066.20 kt CO_2 eq in 1990 to 11,866.31 kt CO_2 eq in 2024, representing a reduction of 46.22%. In terms of trends, the industry has generally undergone changes due to the collapse of the industry in the 1990s and the impact of the coronavirus pandemic in 2020, however increase in demand is being observed. However, obviously, there was no significant increase in the amount of emissions due to the replacement of fuels used in this subcategory with cleaner fuel (transition from residual fuel oil to gas), the transition to the use of low-power technologies in power plants and the use of renewable energy sources.

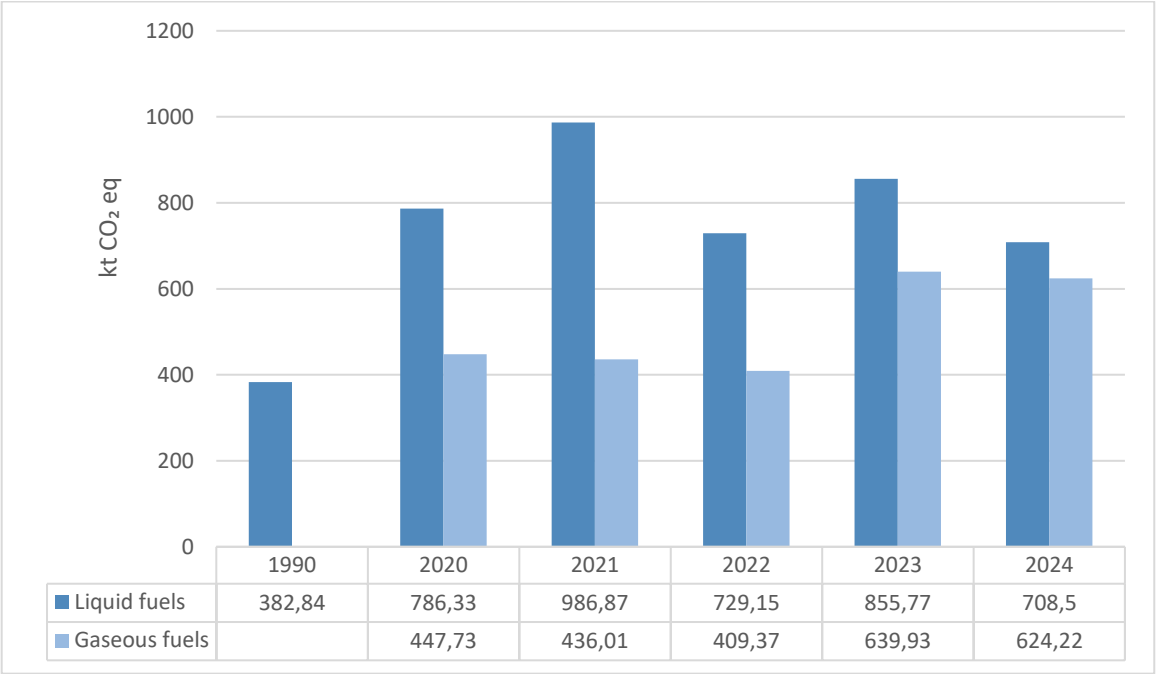
During the more recent period, emissions increased from 13,218.05 kt CO_2 eq in 2020 to 14,628.94 kt CO_2 eq in 2022, remained broadly stable at 14,544.77 kt CO_2 eq in 2023, and then decreased by 18.42% to 11,866.31 kt CO_2 eq in 2024.

The largest decrease in 2024 occurred in electricity generation (1.A.1.a.i), where emissions declined by approximately 21.2%, from 10,675.7 kt CO_2 eq in 2023 to 8,411.2 kt CO_2 eq in 2024. Emissions from combined heat and power generation (1.A.1.a.ii) decreased by approximately 12.8%, from 3,412.2 to 2,974.5 kt CO_2 eq, while emissions from heat plants (1.A.1.a.iii) increased by approximately 5.1%, from 456.8 to 480.1 kt CO_2 eq.

The reduction in emissions is consistent with changes in the electricity-generation mix. Electricity generation from hydropower, wind and solar increased from approximately 1,893.2 million kWh in 2023 to 3,618.4 million kWh in 2024, an increase of approximately 91.1%. At the same time,

generation from thermal power plants decreased from 27,160.4 million kWh to 24,543.2 million kWh, or by approximately 9.6%.

Oil and natural gas are used as fuel in oil refining processes in Azerbaijan (CRT Table, 1.A.1.b.) to meet the demand. GHG emissions from Petroleum Refining amounted to 1,334.50 kt CO_2 eq in 2024, compared with 1,497.80 kt CO_2 eq in 2023, representing a decrease of approximately 10.90%. Figure 39 provides data on emissions released in oil refining processes.



	1990	2020	2021	2022	2023	2024
Liquid fuels	382,84	786,33	986,87	729,15	855,77	708,5
Gaseous fuels		447,73	436,01	409,37	639,93	624,22

Figure 39. GHG emissions from oil refining processes (1.A1.b)

In terms of GHG emission level and trend oil refining in the country is the key category for CO_2 emissions. Petroleum Refining emissions increased from 383.95 kt CO_2 eq in 1990 to 1,334.50 kt CO_2 eq in 2024. However, emissions decreased by 10.90% between 2023 and 2024.

Common factors that condition emission trends include annual production quantities. In recent years, the country's oil production has been rapidly declining. If in 2010-2011 50-51 million tons of oil were produced annually, then in 2015 (after the adoption of PS) it decreased from 41,628 thousand tons by about 23%, and in 2022 it fell to 32,646 thousand tons. This trend is predicted to continue in subsequent years. Crude-oil production has shown a long-term declining trend compared with the peak production levels observed around 2010–2011, which also influences the broader structure of oil-production and refining activities. Oil production declined from 34,531.9 thousand tons in 2020 to 29,052.2 thousand tons in 2024, representing a decrease of 15,86 % over the period.

SOCAR's Oil refinery has been undergoing modernization aimed at improving operational efficiency and fuel quality, including production in accordance with Euro-5 standards. The modernization of refinery infrastructure is expected to contribute to improved process efficiency and lower emission intensity over time.

Emissions from Manufacture of Solid Fuels and Other Energy Industries (1.A.1.c) amounted to 1,017.70 kt CO_2 eq in 2024, compared with 1,011.60 kt CO_2 eq in 2023. The year-on-year increase was limited to approximately 0.60%, indicating broadly stable emissions in this subcategory.

Overall, Public Electricity and Heat Production remained the dominant component of Energy Industries in 2024, accounting for approximately 83.46% of total 1.A.1 emissions. The substantial 16.63% reduction in total Energy Industries emissions between 2023 and 2024 was therefore

driven primarily by lower emissions from electricity generation and combined heat and power production.

3.2.5.2. METHODOLOGICAL ISSUES (1.A.1.)

The Tier 1 approach of the IPCC 2006 Guidelines was used to calculate emissions in energy industries. Emissions from public electricity and heat generation (1.A.1.a) are calculated based on data on the carbon content of fuels provided by the IPCC 2006 Guidelines and national net calorific values (NCVs) reported in State Statistical Committee's energy statistics. The category of Public Electricity and Heat Production includes electric and heat generation of all electric power generation facilities in operation. SOCAR responded to the inquiries developed by national GHG inventory experts to obtain data on fuel used in oil refining.

In 2024, the latest inventory year, a total of 211,073.8 TJ of fossil fuel was combusted in Public Electricity and Heat Production (1.A.1.a). Of this amount, 210,326.3 TJ accounted for natural gas and 747.5 TJ for diesel fuel. Electricity-generating power stations accounted for 148,842.0 TJ of natural gas and 721.5 TJ of diesel fuel; combined heat and power plants used 52,953.6 TJ of natural gas and 13.0 TJ of diesel fuel; and heat plants used 8,530.7 TJ of natural gas and 13.0 TJ of diesel fuel. Tamiz Shahar OJSC also generates electricity through the combustion of municipal waste at the Baku Solid Waste Incineration Plant. At the same time, Tamiz Shahar OJSC generated electricity due to combustion of 8.5 TJ of biomass since 2013. Stone-coal is not used in Azerbaijan for the purpose of obtaining electricity and heat energy. Coal is not used for public electricity and heat generation in Azerbaijan.

Since 1990, the use of natural gas for electricity generation has increased significantly, and most of the residual fuel oil enterprises have been replaced with gas, and new modular power plants operating on natural gas have been built and put into operation. In 2024, the increasing contribution of renewable electricity generation, together with lower generation from thermal power plants, also contributed to the reduction in fuel-combustion emissions from this category. The activity data was taken from the official data of the SSC. Corresponding IPCC default emission factors were applied together with national NCVs, and calculations were performed using the IPCC Inventory Software.

All data on the production of petroleum products were obtained from official statistics. The SSC provides a comprehensive description of transformational inputs and Oil refinery plant’s (ORP) own consumption and imports. For 2024, total reported fuel consumption in Petroleum Refining (1.A.1.b) amounted to 21,464 TJ, comprising 390 TJ of gas/diesel oil, 419 TJ of residual fuel oil, 2,465 TJ of petroleum coke, 7,063 TJ of refinery gas and 11,127 TJ of natural gas.

1.A.1.b Category reports only on crude oil refinery. Since almost all emissions of the oil refinery plant are caused by combustion processes, ORP emissions are reported in 1.A.1.b category, while flaring emissions associated with oil and natural gas activities are reported separately under Category 1.B.2.a.. The GHG inventory applies the Tier 1 approach of the 2006 IPCC Guidelines, the corresponding IPCC emission factors and the IPCC Inventory Software.

Emissions for the 2020–2024 period under the "Other Energy Industries" category (1.A.1.c.ii) have been recalculated based on updated activity data provided by Azneft/SOCAR Upstream operations. This category encompasses fuel consumed for oil and gas extraction, as well as for on-site energy generation used to meet the enterprise's own operational needs. The recalculation was performed to incorporate the updated data and ensure the consistency of the time series for the years 2020–2024. This also enhances the transparency and completeness of the reported data. There has been no change to the emission calculation methodology; the Tier 1 approach, utilizing standard IPCC emission factors, continues to be applied. Thus, the recalculation stems from the updating of activity data and the acquisition of more detailed information regarding fuel consumption.

3.2.5.3 UNCERTAINTIES AND CONSISTENCY OF TIME SEQUENCES (1.A.1)

Uncertainties for activity data were identified for previous reports and current reporting period. This appears in situations that can occur in statistical data collection, changes in technological processes. The uncertainty assessment distinguishes uncertainties associated with activity data from those associated with emission factors and other estimation parameters.

Activity-data uncertainty in Energy Industries (1.A.1) is generally relatively low because fuel-consumption data are derived mainly from official energy statistics and reporting by major energy-sector operators. According to the 2006 IPCC Guidelines, for well-developed statistical systems the indicative uncertainty of activity data for main-activity electricity and heat production is less than 1% when based on surveys and approximately 3–5% when extrapolation is required. For energy-intensive industrial combustion, including refinery-related combustion, the corresponding indicative ranges are approximately 2–3% for survey-based data and 3–5% for extrapolated data. These IPCC ranges provide reference values where sufficiently robust country-specific uncertainty estimates are not available.

Emission factor uncertainty for calculation of CO_2 emission into the atmosphere during natural fuel combustion is relatively small. Because, the emission factor is determined by the carbon content of the fuel. It should be noted that some discrepancies can occur in uncertainties of CO_2 emission factors for petroleum products, coal and natural gas. Therefore, the uncertainties in the emission factors of these three types of fuel are different. Another form of possible uncertainties may lie in the selection of emission factors. The figures are based on the range covered by the carbon content of different fuels.

Uncertainties in emission data are the result of several different factors. A distinction must be made to these, within the framework of emission measurement, random and systematic errors, as well as to the completeness of the database regarding the existing measurements. For example, the variability of the plant's emissions during the mentioned period (intra-plant variability) and the differences between the emissions of different sources under consideration (inter-enterprise variability) increase uncertainties.

In order to estimate the emission amount of CO_2 from the combustion of oil and gas products processed in Azerbaijan the uncertainties of the emission factors taken are very small. This is explained by the fact that there is only one oil refinery and one gas processing plant in the country. Therefore, the range of carbon content of products produced in these plants is small.

As per CH_4 and N_2O gases, uncertainties in their emission factors can be high because emissions depend strongly on combustion technology, operating conditions and emission-control characteristics. For stationary combustion, the 2006 IPCC Guidelines provide default emission-factor uncertainty ranges of approximately 50–150% for CH_4 for public power, cogeneration, district heating and industrial combustion. Uncertainty in default N_2O emission factors may be substantially larger and is characterized by the IPCC as being of an order of magnitude where more representative information is unavailable. Because they are not precisely measurable and therefore their uncertainties are different. Since uncertainties are underestimated in most countries, the IPCC 2006 methodology uses “default” ratios given to relevant sources. According to expert estimates, the uncertainties for emission ratios and activity data used to calculate emissions in the combustion process in the country are close to the default figures. Within the IPCC framework, a limit of ±50% has been estimated for the uncertainty in GHG sources in this category. In this regard, when using emission factors in the literature, all qualitative information provided by the afore-mentioned sources should also be used. In general, it is recommended to use expert reasoning in cases where there is not enough data to quantify the available empirical data.

3.2.5.4 CATEGORY-RELATED QUALITY ASSURANCE / QUALITY CONTROL (1.A.1)

General and category-related quality assurance and quality control were carried out by independent experts in accordance with the requirements of the IPCC Guidelines and the relevant applicable documentation.

To document Quality Assurance Measures in the development of energy balances, the Working Group on energy balances submits relevant quality reports to the SSC. Quality assurance of official statistics is carried out through the internal quality system. Additional cross-checks are undertaken, where appropriate, against underlying fuel-consumption data, the national energy balance and information provided by relevant energy-sector operators.

For Category 1.A.1, particular attention is given to the consistency of fuel-use data across Public Electricity and Heat Production, Petroleum Refining and Other Energy Industries, as well as to the correct application of IPCC emission factors and national net calorific values.

QA activities include review by experts not directly involved in the original calculation, while identified discrepancies, recalculations and corrective actions are documented and incorporated into the inventory improvement process

If necessary, regular exchanges are additionally carried out within the framework of technical meetings with data providers and sector experts to clarify inconsistencies and resolve outstanding issues.

3.2.5.5 CATEGORY-RELATED RECALCULATIONS (1.A.1)

Recalculations for Energy Industries (1.A.1) were carried out primarily for 2020–2022 following the revision and reconciliation of activity data used for fuel-combustion estimates.

The recalculations were driven by the availability of updated and more detailed fuel-consumption data from the State Statistical Committee and, where relevant, sectoral operators. The revised activity data were cross-checked against the latest national energy balance, detailed energy-product balances and underlying sector-specific information. This resulted in adjustments to the quantities and allocation of fuels reported under Public Electricity and Heat Production (1.A.1.a), Petroleum Refining (1.A.1.b), and Manufacture of Solid Fuels and Other Energy Industries (1.A.1.c).

The revisions mainly concerned fuel-consumption activity data, including natural gas and petroleum products, and replaced the corresponding data used in the previous submission where more recent or reconciled official information had become available. The recalculated estimates for Energy Industries amount to 15,686.31 kt CO_2 eq in 2020, 17,157.93 kt CO_2 eq in 2021 and 16,881.21 kt CO_2 eq in 2022.

1.A.1.c.ii – For the "Other energy industries" category, activity data for the entire 2020–2024 period have been updated based on official data sources, and emission estimates have been recalculated accordingly. The adjustment pertains solely to the source of the activity data; the estimation methodology and emission factors remain unchanged, thereby ensuring consistency across the time series.

The recalculation did not involve a change in the estimation Tier or the underlying IPCC calculation methodology. The Tier 1 approach continued to be applied using the relevant IPCC emission factors and national net calorific values, where available. Accordingly, the changes are treated primarily as recalculations resulting from revised activity data and methodological refinement, rather than as a methodological change.

The recalculations improve the accuracy, consistency, comparability and transparency of the estimates by ensuring that fuel consumption reported in the GHG inventory is aligned with the latest official national energy statistics and supporting sectoral information.

3.2.5.6 PLANNED IMPROVEMENTS TO THE CATEGORY (1.A.1)

Taking into account the fact that the energy industry is the category of primary resources, planned improvements, including improvements in the analysis of carbon content values and low heat dissipation ability ratios of residual fuels are envisaged to ensure the collection of statistical activity data.

Relevant measures are intended to improve statistical data on activity sources as the second improvement area in the category. This includes closer reconciliation of data from the State

Statistical Committee with information provided by energy-sector operators, improved documentation of fuel allocation between subcategories, and systematic checks against the national energy balance and detailed commodity balances.

Particular attention will also be given to maintaining time-series consistency when revised activity data become available and documenting recalculations transparently.

For key subcategories, the feasibility of applying more detailed or higher-tier approaches will be assessed where sufficiently robust country-specific activity data and emission parameters become available.

Improvements in the energy sector are provided in the Recalculations and improvements section (Chapter 10).

3.2.5.7. SOLID FUEL PRODUCTION AND OTHER ENERGY INDUSTRY (1.A.1.C)

Manufacture of solid fuels (1.A.1.c.i) does not take place in Azerbaijan, because no solid fuels are produced in the country, and this subcategory is reported as "NO" in the CRT.

3.2.6. Manufacturing industries and Construction (1.A.2)

3.2.6.1 CATEGORY DESCRIPTION

Calculation for structural elements in the subcategory 1.A.2 was revised through the justification of the quality of activity data. In most cases, they are based on data from the SSC. Different division of activity data by sectors was carried out only for the process of fuel combustion.

Although combustion data is presented in accordance with the sector, the available data does not allow for complete disaggregation in accordance with UNFCCC requirements. For example, the heat and energy production of industrial electric and thermal power plants cannot be completely focused on specific sectors. Differentiation of the combustion process associated with energy for heat production in industrial boiler systems was carried out through statistical data. In the latest inventory year of 2024, 43,665.1 TJ of natural gas and approximately 5,267.0 TJ of petroleum products were used in Manufacturing Industries and Construction (1.A.2).

In the latest inventory year, 2024, GHG emissions from Manufacturing Industries and Construction (1.A.2) amounted to 2,843.03 kt CO_2 eq, compared with 15,391.41 kt CO_2 eq in 1990, representing a decrease of 81.53% over the inventory period. Natural gas remained the principal fuel used for stationary combustion in the category, while liquid fuels contributed a smaller share of fuel use.

Emissions fluctuations in this category in recent years reflect production trends in the manufacturing sector of Azerbaijan, which are related to general economic trends. This resource category consists of manufacturing industry sectors. The IPCC classifies the manufacturing industry as iron and steel, non-ferrous metals, chemical, pulp, paper and printing, food processing, beverages and tobacco, non-metallic minerals and other industries.

	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024
1.A.2.a	724.3	347.8	122.6	237.2	61.9	105.1	37.3	52.2	49.4	53.7	98.9
1.A.2.b	1,390.2	670.2	208.0	273.7	18.5	9.8	4.5	9.1	19.5	16.7	9.0
1.A.2.c	2,129.0	1,029.3	272.8	116.6	448.0	570.7	776.4	579.0	877.4	786.5	687.5
1.A.2.d	4.0	1.9	0.5	0.2	2.6	4.4	4.6	5.3	5.5	3.7	3.7
1.A.2.e	1,436.0	702.0	200.7	177.0	507.8	853.4	283.1	287.5	348.7	371.5	341.1
1.A.2.f	6,753.1	3271.1	871.8	378.6	257.8	562.3	857.4	948.5	1045.0	1,174.9	1,170.9
1.A.2.g	12.7	8.8	11.7	17.1	11.7	20.9	0.8	0.8	0.8	0.8	0.4
1.A.2.h	1,086.5	528.4	144.7	70.8	31.0	64.1	39.1	36.6	57.9	38.2	29.0
1.A.2.i	151.3	122.3	95.3	123.6	31.0	28.7	50.4	54.1	58.9	45.5	43.6
1.A.2.j	4.0	1.9	0.5	0.2	0.4	6.1	0.2	0.2	0.0	0.2	0.2

1.A.2.k	423.0	386.2	48.8	121.3	171.7	268.9	318.1	300.6	394.6	435.7	416.5
1.A.2.l	74.0	31.1	8.2	3.5	9.0	15.4	27.9	26.9	23.1	24.4	24.9
1.A.2.m	1,203.3	582.6	154.4	66.0	1.2	55.2	10.8	14.9	16.0	16.4	17.3

Table 23. GHG emissions from manufacturing industry and construction, kt CO_2 eq.

GHG emissions from Manufacturing Industries and Construction declined substantially from 15,391.41 kt CO_2 eq in 1990 to 2,843.03 kt CO_2 eq in 2024, corresponding to a reduction of 81.53%. The long-term decrease reflects the contraction and restructuring of energy-intensive industrial activity following the dissolution of the Soviet Union, followed by modernization of industrial infrastructure, changes in the structure of production and improvements in the efficiency of fuel use.

In the more recent period, emissions increased from 2,315.67 kt CO_2 eq in 2021 to 2,968.05 kt CO_2 eq in 2023, before decreasing by 4.21% to 2,843.03 kt CO_2 eq in 2024.

1.A.2. "Processing industry and construction" is a subcategory of the Fuel combustion category. This subcategory is divided into the following, corresponding to production areas:

- Iron and Steel (1.A.2.a) - is the key category in terms of emission levels and trends for CO_2 emissions. Iron and steel industry along with cement industry in the field of technological combustion, is the second important source of CO_2 emissions. Emissions increased substantially in the latest inventory year, from approximately 53.7 kt CO_2 eq in 2023 to 98.9 kt CO_2 eq in 2024, an increase of approximately 84.2%, largely reflecting higher natural-gas consumption.
- Non-ferrous metals (1.A.2.b) include emissions released as a result of combustion processes in various areas of non-ferrous metal production. At the same time, it should be noted that the available statistics do not support more detailed description of emissions. Emissions decreased by approximately 46.1% between 2023 and 2024.
- Main relevant facilities in the chemical (1.A.2.c) industry consist of industrial-purpose power plants and boiler houses. Such facilities are reported in 1.A.2.g other sub-category for all sectors. Emissions decreased by approximately 12.6% in 2024 compared with 2023. This decline was driven predominantly by lower gaseous-fuel consumption, which decreased from approximately 13,749.1 TJ in 2023 to 12,065.6 TJ in 2024.
- Pulp, paper and printing (1.A.2.d) is not the key category.
- Food Processing, Beverages and Tobacco (1.A.2.e) includes combustion emissions from food and beverage manufacturing. Emissions decreased by approximately 8.2% between 2023 and 2024.Transport equipment (1.A.2.g vii) - stationary and mobile sources in 1.A.2.g are grouped together for the purposes of attributing them to the key categories. Accordingly, Category 1.A.2.g vii - Other: Cars and other vehicles, where emissions from the construction sector transport are taken into account, are the key category for CO_2 in terms of emission levels and trends.
- Non-Metallic Minerals (1.A.2.f) remained one of the largest sources of fuel-combustion emissions within Manufacturing Industries and Construction. Emissions remained broadly stable in 2024, decreasing by approximately 0.3% compared with 2023.
- Machinery (1.A.2.h) emissions decreased by approximately 24.1% in 2024 compared with 2023.
- Mining and Quarrying excluding fuels (1.A.2.i) emissions decreased by approximately 4.2% between 2023 and 2024.
- Wood and Wood Products (1.A.2.j) represent a minor source within the category.
- Construction (1.A.2.k) includes stationary fuel combustion associated with construction activities. Emissions decreased by approximately 4.4% in 2024 compared with 2023. Natural-gas consumption in this subcategory also declined substantially in the latest year.
- Textile and Leather (1.A.2.l) emissions increased moderately, by approximately 2.0%, in 2024.
- Non-specified Industry (1.A.2.m) covers industrial fuel combustion that cannot be allocated to a more specific manufacturing category using the available data. Emissions increased by approximately 5.5% between 2023 and 2024.Other power generation (1.A.2.G viii) - all emissions for 1.A.2.c sub-category are included in other category (IE). For this reason,

1.A.2.c sub-category is not mentioned separately as the key category. In the chemical industry, most emissions come from combustion processes. Therefore, emissions from the energy-related use of fuels in the chemical industry are reported in the 1.A.2.gviii "Other" category along with the emissions for other industrial sectors. As mentioned, this is to avoid double calculation with the SPMI sector. In addition, it is important to ensure that the emissions resulting from the combustion of other extracted gases are not underestimated. Therefore, the first analytical step was to identify areas of the chemical industry where other extracted gases are generated and used for energy generation. More than half of the gas generated is used in the production of other organic base materials and chemicals. Still a small part of these gases is used in the manufacture of plastics in primary forms. The corresponding gas consumption for recalculation was determined by the main products produced in each sector. Despite the fact that combustible coal is used in this area in developed countries, natural gas is used as fuel in Azerbaijan historically and currently.

Despite the recovery of industrial activity in a number of subsectors since the early 2000s, emissions from Manufacturing Industries and Construction in 2024 remained 81.53% below the 1990 base-year level.

3.2.6.2 METHODOLOGICAL ISSUES (1.A.2)

Since 2010, the division of national energy balance sheets by sectors partially corresponds to IPCC categories. All data are taken from the annual data of the SSC. The Tier 1 approach of the IPCC 2006 Guidelines was used to calculate emissions in the Processing industry and Construction categories.

The relevant calculations were carried out with IPCC software using emission factors and SSC data on activities in accordance with the IPCC 2006 Guidelines.

3.2.6.3. UNCERTAINTIES AND TIME SEQUENCE MATCHING (1.A.2)

Uncertainties are similar to those in the energy industry (1.A.1).

3.2.6.4. QUALITY ASSURANCE / QUALITY CONTROL (1.A.2)

Quality control and Quality Assurance were carried out by the relevant specialists in accordance with the requirements of the IPCC 2006 Guidelines and other related relevant documents.

3.2.6.5 SUBCATEGORY-RELATED RECALCULATIONS (1.A.2)

No recalculations have been carried out.

3.2.6.6 PLANNED IMPROVEMENTS ON THE SUBCATEGORY (1.A.2)

As an area of improvement in the category, appropriate measures are envisaged to improve statistical data on the sources of activity.

3.2.7. Transport (1.A.3)

3.2.7.1 SUBCATEGORY DESCRIPTION (1.A.3)

The assessment of emissions in transport is carried out by the following sources:

- Domestic Aviation (1.A.3.a)
- Road Transportation (1.A.3.b)
- Railways (1.A.3.c)
- Domestic Water-borne Navigation (1.A.3.d)
- Pipeline (other transport) (1.A.3.e.i)
- Off-road (other transport) (1.A.3.e.ii)

According to the latest inventory estimates, total GHG emissions from Transport increased from 6,091.53 kt CO_2 eq in 1990 to 10,765.84 kt CO_2 eq in 2024, representing an increase of 76.73% over the inventory period. Compared with 2023, Transport emissions increased by 7.93% in 2024. The relative importance of Transport within the Energy sector has also increased. Transport accounted for approximately 7.60% of total Energy-sector GHG emissions in 1990 and approximately 18.04% in 2024.

Road transportation remained the dominant source within the Transport category. In 2024, road transportation emissions amounted to 10,008.96 kt CO_2 eq, accounting for approximately 92.97% of total Transport emissions. Domestic aviation accounted for approximately 6.16%, domestic water-borne navigation for 0.75%, railways for 0.06%, and Other Transportation, including pipeline and off-road transport, for approximately 0.06%.

	Domestic Aviation	Road Transportation	Railways	Domestic Water-borne Navigation	Other Transportation
1990	462.06	5367.78	124.54	100.76	36.39
1995	55.99	2,805.08	42.02	32.71	NE
2000	52.88	1,959.01	57.73	29.36	NE
2005	199.07	3,387.48	91.47	49.31	NE
2010	279.63	4,623.64	11.35	88.14	0.30
2011	321.31	5,419.88	62.08	110.43	8.80
2012	339.04	6,000.66	60.61	117.14	9.64
2013	484.91	6,762.21	62.66	102.14	12.52
2014	513.22	6,998.47	53.07	95.75	13.31
2015	587.25	6,379.06	55.97	83.13	12.08
2016	703.27	5,815.64	56.26	91.60	13.30
2017	1,005.91	6,617.23	30.65	151.29	9.61
2018	1,122.24	7,248.55	21.92	137.25	9.47
2019	933.75	7,452.43	28.59	97.98	7.66
2020	411.82	6,384.58	6.98	124.16	5.00
2021	296.43	7,286.74	6.59	183.53	4.62
2022	473.10	8,545.22	39.08	179.69	4.52
2023	587.87	9,154.33	4.54	222.79	4.98
2024	663.63	10,008.96	5.99	81.14	6.12

Table 24. GHG emissions from Transport for 1990-2024, kt CO_2 eq.

3.2.7.2. METHODOLOGICAL ISSUES (1.A.3)

The activity data for calculating transport emissions are taken from the annual data of the SSC in TJ. Air transport emissions were calculated in accordance with the Tier 1 of the IPCC 2006, based on the type and amount of fuel (kerosene and aviation gasoline) used for national flights. Flights in Azerbaijan are classified as domestic or international. This division plays a decisive role in the report. CO_2 emissions directly depend on fuel consumption.

Calculations are carried out in general for out for motor vehicles, motorcycles, light trucks, heavy trucks, buses and other categories of vehicles. Thus, since there is no data on the type and quantity of fuel used by separate types of transport in Azerbaijan, the data on the fuel sold of the SSC were used. For calculation purposes, the sources of vehicles were taken as types of vehicles with the same emission behavior. The Tier 1 approach of the IPCC 2006 guidelines was used. Despite the fact that road transport is one of the main sources of GHG emissions, it is still difficult to properly distribute emissions due to the lack of a reliable MRV system for collecting data on national GHG, standard carbon content and EF. This hinders the inventory process, as well as the evaluation of the results of measures taken by the state to reduce emissions from these sources. For example, the application of e-mobility technology and the use of low-emission fuels in public transport (buses and taxis), etc.

Emissions from airport ground operations involving off-road vehicles and mobile machinery have been included under this category. The activity data for 2020–2024 were updated based on official information provided by the Civil Aviation Agency under the Ministry of Digital Development and Transport. These data cover the fuel consumption of ground support equipment (GSE) operating within airport premises, including baggage and cargo tractors, aircraft pushback tugs, baggage loaders, mobile passenger boarding stairs, other loaders, aircraft de-icing vehicles and other ground support equipment.

The activity data are reported in Table 25 in terajoules (TJ). Emissions were estimated using the Tier 1 approach, in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, applying the relevant IPCC default emission factors.

Data on activities for the use of fuel in off-road transport (mainly airport cargo) for 2017-2024 were provided by the Ministry of Digital Development and Transport.

Type of fuel	unit	2020	2021	2022	2023	2024
Motor gasoline	TJ	2.1583	2.4359	2.1400	2.8075	3.6869
Gas/Diesel oil	TJ	35.0928	35.5310	34.6540	45.0885	55.6003

Table 25. Activity information on off-road transport (airport territory and other special modes of transport)

1.A.3.b.iii - Heavy trucks and buses - it was decided to include emissions from the consumption of natural gas in road transport. During consultations with the Ministry of Digital Development and Transport, it was agreed that compressed gas is used in public buses in Baku. It is used in taxis and private cars only in small quantities. All emissions from combustion of compressed natural gas in Sub-Category 1.A.3.b.iii were decided to be calculated. Further studies are planned to be carried out to separately calculate emissions for heavy trucks and buses.

3.2.7.3. UNCERTAINTIES AND TIME SEQUENCE MATCHING (1.A.3)

Uncertainties are evaluated similar to the energy industry (1.A.1). Uncertainties of CO_2 emission factors were determined according to the IPCC 2006 Guidelines. These figures are based on various estimates, as well as a small number of measurement and analysis results and thus have a large range of uncertainty.

3.2.7.4. CATEGORY-RELATED QUALITY ASSURANCE / QUALITY CONTROL (1.A.3)

Quality Control and Quality Assurance were carried out by the relevant specialists in accordance with the requirements of the IPCC 2006 Guidelines and other related relevant documents.

3.2.7.5. CATEGORY-RELATED RECALCULATIONS (1.A.3)

Recalculations were carried out for off-road transport for the period 2020–2024. The activity data were updated using information obtained from the Civil Aviation Agency of the Ministry of Digital Development and Transport, as explained in Section 3.2.7.2. The update affects only the activity data, while the estimation method and Tier level remain unchanged. Therefore, the recalculation reflects the use of updated data rather than a change in methodology.

3.2.7.6. PLANNED IMPROVEMENTS TO THE CATEGORY (1.A.3)

As an area of improvement in the category, appropriate measures are envisaged to improve statistical data on activity sources in accordance with the IPCC 2006 Guidelines.

3.2.8. Other: Residential, commercial / institutional, agricultural, forestry and fishing (1.A.4)

3.2.8.1 CATEGORY DESCRIPTION (1.A.4)

Other, stationary and mobile sources for the category 1.A.4 are grouped together in order to determine the status of the key category. Other sub-categories of 1.A.4 – 1.A.4.a, b and c are the main sources for CO_2 emissions in terms of emission level from sources and trend. 1.A.4.a source is the primary source of CH_4 in terms of trend. 1.A.4.b is the key category in terms of Level 1 analysis. Also, 1.A.4.b sub-category was defined as the key category for N_2O through the analysis of approach 1. Stationary and mobile sources categories in 1.A.4 are grouped together in order to determine the status of a key-category.

1.A.4 – Others subcategory include 1.A.4.a - Commercial and institutional (administrative buildings, trade and services), 1.A.4.b - Residential place, 1.A.4.c - Agricultural, forestry and fishing sources.

1.A.4.a provide information on emissions from commercial and institutional (stationary) heat generation systems in small combustion systems of small commercial and institutional users.

1.A.4.b sources provide information on emissions of stationary combustion systems in the residential sector. In the current inventory, residential emissions arise predominantly from stationary combustion, particularly natural gas use for space heating, water heating and cooking.

1.A.4.c sources covers the stationary part of agricultural, forestry and fishing areas. The report in this category includes emissions resulting from heat production in small and medium combustion systems.

In residential and commercial/institutional resources, the combustion systems group is very diverse in terms of installation design and size. It covers a wide range of combined-type heaters of various sizes and various room stoves (such as fireplaces, stoves). The main source of CO_2 emissions in 1.A.4 is energy consumption for the purposes of heating spaces. Therefore, the change in consumption is highly dependent on weather conditions. The energy consumption is associated with residential fuel use, particularly space heating and other household energy needs. Consumption may therefore show year-to-year variation associated with weather conditions as well as changes in energy demand and fuel supply.

Starting in 1990, the transition from oil and coal to natural gas in that period has led to a significant reduction in CO_2 emissions. Improving energy efficiency has also contributed to reducing consumption.

The emissions included in this subcategory arise mainly from fuel consumption in commercial/institutional, residential and agricultural/forestry/fishing. The increase in emissions from this category is mainly the result of measures carried out within the framework of population growth and gasification of regions.

Total GHG emissions from Other Sectors increased from 10,536.60 kt CO_2 eq in 1990 to 11,284.13 kt CO_2 eq in 2024, an increase of 7.09%. The overall trend reflects substantially different developments among the three subcategories.

Residential remained the dominant source in 2024, accounting for approximately 78.9% of 1.A.4 emissions, followed by Agriculture/Forestry/Fishing at approximately 11.8% and Commercial/Institutional at approximately 9.4%.

Residential emissions increased from 5,642.80 kt CO_2 eq in 1990 to 8,901.35 kt CO_2 eq in 2024, an increase of 57.75%. In contrast, Commercial/Institutional emissions decreased by 33.29%, from 1,582.79 to 1,055.95 kt CO_2 eq, while Agriculture/Forestry/Fishing emissions decreased by 59.93%, from 3,311.01 to 1,326.84 kt CO_2 eq.

In the latest year, total 1.A.4 emissions decreased by 8.13%, from 12,282.71 kt CO_2 eq in 2023 to 11,284.13 kt CO_2 eq in 2024. This decrease was driven almost entirely by Commercial/Institutional emissions, which declined by 52.24%, while Residential emissions increased by 1.38% and Agriculture/Forestry/Fishing emissions increased by 2.72%.

3.2.8.2 METHODOLOGICAL ISSUES (1.A.4)

Activity data were calculated based on data from the State Statistical Committee (SSC), including annual energy statistics and relevant national energy-balance information, and emission factors were calculated based on the IPCC 2006 Guidelines.

The determination of emission factors is based on a category-specific bottom-up approach. In addition, to differentiate sub-categories and fuels data on emission factors are collected across all systems within the mentioned sub-categories.

To assess emissions from other sectors, most of the activity data was taken from the SSC's annual data and the Tier 1 approach of the IPCC 2006 Guidelines was applied. To differentiate standard carbon content and emission factors and the activity data for Category 1.A.4.c, an expert opinion is used, which assumes that emissions from fossil fuel combustion occur mainly during Mobile combustion. In 2024, Residential accounted for approximately 78.9% of total GHG emissions from Other Sectors. Agriculture/Forestry/Fishing contributed approximately 11.8%, while Commercial/Institutional accounted for approximately 9.4%. Activity data in the 1.A.4 category

source are taken from the SSC, like stationary combustion systems. All of the gasoline fuels listed on residential sector are allocated to mobile sources (1.A.4.b ii).

It also includes commercial and institutional, fuel consumption areas of the sector, which are separately mentioned in statistics. An additional distribution is carried out in Agricultural (1.A.4.c ii (i) and Forestry (1.A.4.c ii (ii)) areas.

1.A.4.C (iii) – Activity data on coastal and open sea fisheries included in the Fisheries clause is calculated within the framework of an expert assessment.

In general, the amount of combusted lubricants is derived from the corresponding annual fuel quantities accordingly. Regarding CH_4 and N_2 emissions as a result of joint combustion of lubricants, it is assumed that such emissions have already been taken into account in the corresponding emission factors for the fuels already used and thus must be reported as IE (included elsewhere).

3.2.8.3 UNCERTAINTIES AND TIME-SERIES CONSISTENCY (1.A.4)

Uncertainties are evaluated similar to the energy industry (1.A.1). A complex procedure is usually required for the method used in order to identify uncertainties for the activity data. Along with the emission figures, it is also necessary to obtain other information, for example, the corresponding operating mode, installation structure and final power consumption specific to the device should be taken into account. Nevertheless, given the large number of objects involved and the wide range of combustion systems and fuels used, it should be assumed that the data has sufficient “uncertainty”.

Besides, emission factors for combustion systems are determined in accordance with the design of the device, age level, output category and typical operating mode. And the information about this is almost not available.

Moreover, for some types of installation, there is only inadequate or no information about the amount of emissions associated with the use of certain fuels. It is important to note that current legislation does not require the measurement of greenhouse gas emissions of combustion systems of residential and commercial/institutional users.

3.2.8.4 CATEGORY-RELATED QA/QC AND INSPECTION (1.A.4)

In accordance with the requirements of the IPCC 2006 Guidelines related to emission factors and the applicable documents associated with it, category-specific quality control and quality assurance were carried out by the relevant experts.

3.2.8.5 CATEGORY-RELATED RECALCULATIONS

No recalculation has been carried out for this category.

3.2.8.6 PLANNED IMPROVEMENTS TO THE CATEGORY (1.A.4)

Ensuring the collection of statistical data on activities in accordance with the IPCC 2006 classification is included in the Improvement Plan (Chapter 10).

3.3. Fugitive emissions from fuels (1.B)

Fugitive emissions can be released into the atmosphere during the extraction, processing, transportation, storage, distribution and use of natural fuel oil and gas. Methane emissions are the most important emissions in the source category of fugitive oil and gas emissions.

3.3.1. Solid fuels (1.B.1)

No activities are carried out on solid fuels (coal, turf, etc.) in Azerbaijan. In CRT tables, this activity is marked as “NO”.

3.3.2. Fugitive emissions from oil and natural gas (1.B)

3.3.2.1 FUGITIVE EMISSIONS FROM OIL AND NATURAL GAS PRODUCTION (1.B.2)

The fugitive emissions subcategory includes the emissions that are released as a result of extraction, production, processing, transportation, storage, distribution of non-combusted residual fuels, etc.

3.3.2.1.1 CATEGORY DESCRIPTION (1.B.2)

This resource category includes fugitive CO_2, N_2O, CH_4 emissions as a result of exploration, production, preparation, transportation and storage of oil and natural gas. This category includes three subcategories - oil (1.B.2.a), natural gas (1.B.2.b), venting and flaring (1.B.2.c).

This category is the key category in terms of emission levels and CH_4 emission trend. Fugitive emissions from oil and natural gas systems decreased from 25,120.71 kt CO_2 eq in 1990 to 20,559.14 kt CO_2 eq in 2024, representing an overall reduction of 18.16%. Their share of total Energy-sector emissions was 31.3% in 1990 and approximately 34.5% in 2024.

Natural-gas systems represented approximately 67.6% of total 1.B.2 emissions in 2024, compared with approximately 25.3% from venting and flaring and 7.1% from the remaining oil-system sources. As of 2017, according to emissions from the exploration process, it was included in 1.B.2.a.iii.2 - Oil production and processing clause. In subsequent recalculations, it is planned to provide a time sequence by including emissions from exploration works for 1990-2019 in the same category.

Between 2023 and 2024, total 1.B.2 emissions increased by 3.22%, from 19,918.33 to 20,559.14 kt CO_2 eq. The increase was driven mainly by natural-gas systems, where emissions increased by 5.6%, from 13,153.67 to 13,890.76 kt CO_2 eq.

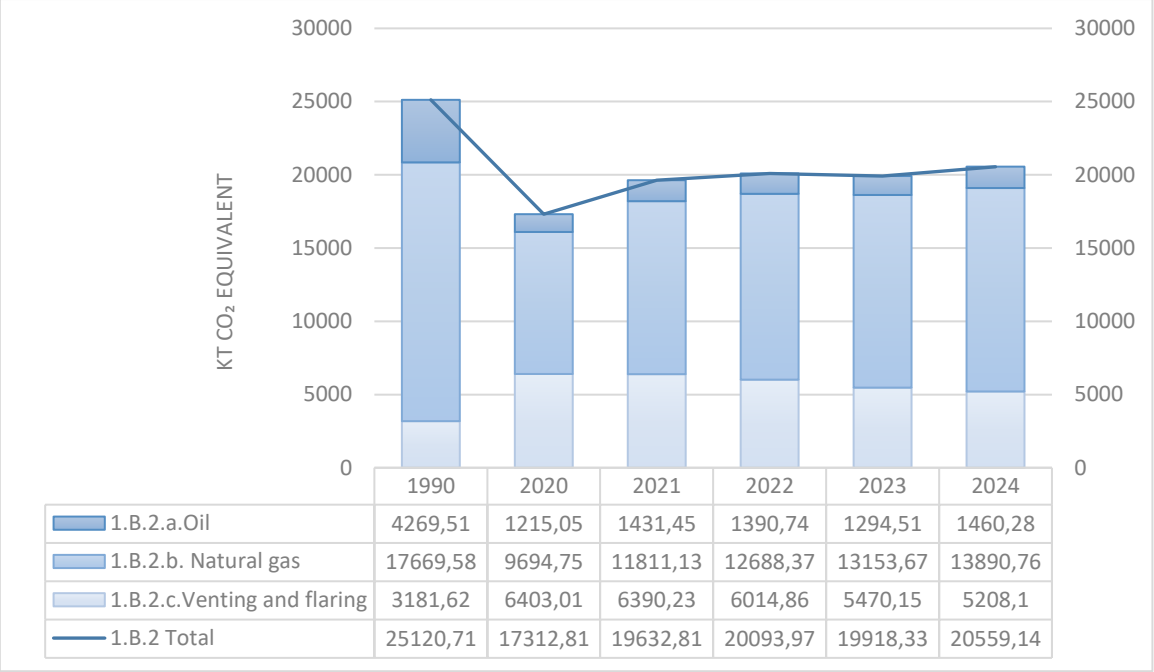
Within natural-gas systems, emissions associated with production increased by approximately 6.0%, from 12,432.5 to 13,181.5 kt CO_2 eq. Transmission and storage emissions increased by approximately 4.7%, while processing emissions decreased by approximately 3.7% and distribution emissions decreased by approximately 11.1%.

The increase in natural-gas-system emissions broadly corresponds to changes in underlying production and throughput activity data. It should not be attributed solely to changes in gas exports, as fugitive emissions depend on the specific activity levels and emission characteristics of production, processing, transmission, storage and distribution infrastructure.

In contrast, flaring emissions decreased by approximately 4.9% between 2023 and 2024, while venting emissions decreased by approximately 3.6%. By contrast the emissions associated with natural-gas production increased.

Recent methane-management measures provide additional operational context for these trends. SOCAR joined UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0) in 2024 and has been strengthening leak detection, methane measurement and emissions-management activities. UNEP's International Methane Emissions Observatory also documented methane emissions at the Neft Daşları offshore complex in 2024; following installation of a low-pressure gas line to recover associated gas previously vented, subsequent satellite observations confirmed that the detected emissions were no longer observed at the affected platforms.

CH_4 emissions are mainly caused by oil production, as well as its pipeline transmission and distribution of natural gas. As a result of numerous measures taken to reduce technological losses in distribution and transmission networks, a significant reduction in emissions from gas transmission and distribution processes has been observed since 1990.



	1990	2020	2021	2022	2023	2024
1.B.2.a.Oil	4269,51	1215,05	1431,45	1390,74	1294,51	1460,28
1.B.2.b. Natural gas	17669,58	9694,75	11811,13	12688,37	13153,67	13890,76
1.B.2.c.Venting and flaring	3181,62	6403,01	6390,23	6014,86	5470,15	5208,1
1.B.2 Total	25120,71	17312,81	19632,81	20093,97	19918,33	20559,14

Figure 40. GHG emissions from oil and gas systems 1.B.2

The growth trend of methane emissions from natural gas systems is mainly due to the increased supply of natural gas to the EU in connection with the obligations arising from the Memorandum of Understanding on strategic partnership in the field of Energy signed with the European Union. The increase in methane emissions from the distribution network is associated with population growth and an increase in the rate of gasification in the regions. These measures make it possible to prevent deforestation and uncontrolled burning of biomass for energy purposes.

Since 2017, the gas combustion in the torch during natural gas operations has been completely stopped, and in this regard, the “NO” registration key has been used for the following years. Emissions into the air during natural gas operations are included in the category of natural gas production.

3.3.2.1.2. METHODOLOGICAL ISSUES (1.B.2)

GHG emissions from Sector 1.B.2 were calculated using the Tier 1 approach of the IPCC 2006.

Transport of crude oil (1.B.2.a.iii.3)- This category covers fugitive emissions arising during the transport of marketable crude oil to upgraders and refineries. Fugitive emissions from the transportation of crude oil and condensate in accordance with the IPCC 2006 Guidelines (Vol.2, PG. 4.40, figure 4.2.3) are estimated based on the amount and emission factor of oil by using the Tier 1 method. Oil export data reflected in the statistics were used as activity data for 2020–2024. The default values provided in the 2006 IPCC Guidelines were used as emission factors. Official statistics were used as activity data. Domestic production data for oil and natural gas were taken from the national energy balance. Data on oil transport were taken from the oil export statistics of the State Statistics Committee. Data on natural gas transmission and distribution and on the volumes of processed natural gas were provided by SOCAR (SOCAR is the state company responsible for the transmission, storage, distribution and processing of natural gas).

The difference between SOCAR and SSC data on activities by the volume of oil processed was analyzed and the activities data provided by the SSC were used to ensure a conservative approach.

Data on the volume of transmission of oil and natural gas through the pipeline and the storage of natural gas, including data on the volumes of distributed and processed natural gas, were provided by SOCAR (a state-owned company responsible for the transportation of crude oil and natural gas).

Fugitive GHG emissions from oil and natural gas systems were calculated using the IPCC 2006 Guidelines. Since this category is the main in terms of CH_4emission level and trend, levels in the assessment of CH_4 emission should be increased. A detailed study was implemented to find out the existence of country-related EF. To clarify the availability of the information required for the Level 2/Level 3 Assessment of CH_4, it is planned to cooperate directly with the relevant authorities and to continue research in this area.

According to the data obtained as a result of chromatographic analysis at SOCAR's Gas Processing Plant, the share of methane and carbon dioxide in unrefined natural gas is 93.5% and 3.5-4%, respectively, and the share of methane gas in processed natural gas is 98%. It was decided to divide losses into types of activities in order to include data on losses in the IPCC inventory software. Thus, 1/6 of the total volume of natural gas is lost during extraction, 2/6 in the transmission network and 3/6 in the distribution network.

This category studies fugitive CH_4 emissions, which occur during the processing and storage of crude oil in oil refineries.

From this source, CO_2 emissions are reported as "NE". Since there are neither actual dimensions of the CO_2 content of crude oil nor any standard values for emission factors exist, CO_2 from this source are not estimated. N_2O emissions from this source are reported as "IE".

Refining (1.B.2.a.iii.4). This category covers fugitive emissions arising during the processing of crude oil at oil refineries. For the Refining category, activity data for 2020–2024 were calculated on the basis of official data obtained from SOCAR. Operator data reflect the actual throughput of the refinery. This is not a recalculation of previously reported values but a calculation carried out in this inventory for 2020–2024 on the basis of newly obtained SOCAR data.

1.B.2.a.i Venting. Activity data (AD) for venting from oil production for 2023 and 2024 were calculated using the surrogate (substitute data) method. This method is one of the techniques described in Chapter 5 of Volume 1 of the 2006 IPCC Guidelines for ensuring time-series consistency. For these two years, no directly measured data or complete data provided by the operator on the volume of venting were available. Official statistics on oil production, however, are available for the whole period. Therefore, venting AD for 2023 and 2024 was estimated on the basis of the volume of oil production. Oil production is a suitable surrogate parameter for venting because the two quantities are physically linked. Associated gas is released together with crude oil, so the volume of gas that may be vented changes together with the volume of oil produced. The surrogate method uses the relationship between venting and production observed in the latest year for which reliable data are available and applies this relationship to the official production figures of the corresponding years. For this reason, the method was considered to provide the most accurate and the most transparent estimate.

Natural gas transmission and storage (1.B.2.b.iii.4). For natural gas storage, activity data for 2023 and 2024 were calculated by extrapolating the existing time series. Trend extrapolation is one of the techniques described in Chapter 5 of Volume 1 of the 2006 IPCC Guidelines (Section 5.3.3) for ensuring time-series consistency. The method was applied to continue the existing time series and to fill the data gap for the last two years, for which data were not available at the time of reporting.

3.3.2.1.2.1. Distribution of petroleum products (1.B.2.a.v).

In Azerbaijan CO_2 and CH_4 emissions can be discarded from the distribution of petroleum products. However, as a result of the activity, emission of CO_2 or CH_4 is considered insignificant in terms of of petroleum products properties. In addition, the IPCC 2006 Guidelines and its 2019 upgrade document provide “NA” for this source.

Other (abandoned oil wells, etc.) (1.B.2.a.vi). This includes fugitive emissions from abandoned oil wells, accidents, etc. The GHG assessment method for gas emissions from the abandoned oil wells is not provided for in the IPCC 2006 Guidelines. In this regard, fugitive emissions from the abandoned wells are reported as “NA”.

According to expert estimates, there are no emissions from the abandoned oil wells in Azerbaijan. Therefore, it is reported as “NA” for these sources, that is, activity occurs, but there are no emissions. And if occurs, it is negligible.

Fugitive emissions as a result of the accident are reported as “NE”. It is very difficult to determine the amount of GHG emissions in these sources. This category analyzes the fugitive emissions of CO_2, CH_4 and N_2O as a result of exploratory drilling of natural gas fields. According to SOCAR, greenhouse gas emissions caused by exploration drilling of natural gas wells in Azerbaijan are combusted in torches as per the instructions. Therefore, “Exploration” for natural gas (1.B.2.b.i) is reported as "NA" in the CRT and the emissions released into the air during exploration drilling for natural gas are not calculated, only "Flaring (gas) (1.B.2.c.ii.2)" is assessed.

Emissions were assessed based on the Tier 1 method according to the IPCC 2006 Guidelines (Vol. 2, PG. 4.42, figure 4.2.1) and using the latest software model of the IPCC.

Since the improved IPCC 2006 emission factors do not indicate the cleaving degree of leaks, ventilation and flaring for gas collection, leakage is accepted for all CH_4 and CO_2 emissions, and flaring for all N_2) emissions. The emissions resulting from flaring are described in “Flaring (gas) (1.B.2.c.ii.2)” section of CRT.

3.3.2.1.3. CATEGORY-RELATED QA/QC

General inventory quality control procedures were carried out in accordance with the IPCC 2006 Guidelines. In this regard, the main focus is directed on checking parameters for activity data and emission factors and archiving reference materials. In accordance with the requirements of the IPCC 2006 Guidelines and relevant documentation, quality control and quality assurance of the category were carried out by the experts involved.

3.3.2.1.4. ANALYSIS OF UNCERTAINTIES (1.B.2)

The uncertainty of emission factors for fugitive CO_2 and CH_4 emissions generated from the production, transportation, storage and distribution of crude oil and condensate is adopted as ±100% in the IPCC 2006 Guidelines. As for the uncertainty of the activity data, the IPCC 2006 Guidelines use up to ±15% of the uncertainties regarding the given values.
Emission factors on natural gas (1.B.2b) are used in the IPCC 2006 Guidelines, the uncertainty for CO_2 and CH_4 was ±20%. Since the impossibility to determine the uncertainty in the source statistics for the activity data, it was used as specified in the IPCC 2006 Guidelines (uncertainty in the number of production facilities: ±25%). As a result, during the exploration drilling of natural gas fields, the uncertainties of CO_2 and CH_4 emissions were estimated at ±32%.

The activity data for venting from oil production in 2023–2024 and for the storage of natural gas in 2023–2024 are estimated based on the extrapolated data due to unavailability of actual Activity Data, so their uncertainty is expected to be higher than the IPCC default range of up to ±15% mentioned above. For venting, the additional uncertainty arises mainly from the assumption that the ratio of venting to oil production of 2022 remained unchanged, for gas storage it arises from the extrapolation of past data. The default values were used in the current uncertainty analysis and the additional uncertainty was not quantified separately. A country-specific assessment will be considered when operator data become available.

3.3.2.1.5. CATEGORY-RELATED RECALCULATIONS (1.B.2)

During preparation of the current inventory, estimates for Category 1.B.2 were comprehensively reviewed and recalculated, primarily for the previously reported years 2020–2022. The recalculations were driven mainly by the availability of updated and more detailed activity data provided by SOCAR and by the reconciliation of these data with official national energy statistics.

The revised activity data improved the representation of individual stages of the oil and natural-gas systems, including oil production and upgrading, transport, refining, venting and flaring, as well as natural-gas production, processing, transmission and storage, and distribution. Where sufficiently disaggregated operator data were available, these data replaced earlier aggregated values or simplified allocation assumptions.

Where annual activity data were not available for individual years or source categories, IPCC-consistent extrapolation was applied using the available time-series information and the most representative activity data or related activity indicators. Such extrapolation was used only to bridge identified data gaps and to maintain a complete and internally consistent time series. Where improved or actual activity data subsequently became available, the corresponding estimates were reviewed and updated.

The treatment of the individual subcategories is as follows. For refining (1.B.2.a.iii.4) and oil transport (1.B.2.a.iii.3) the activity data for 2020–2024 were recalculated on the basis of official data from SOCAR. For venting from oil production, the activity data for 2023 and 2024 were obtained with the surrogate data method, using oil production as the surrogate parameter and the ratio of venting to production of 2022 (0.34346); this gave 11,633.92 × 10^3 m^3 and 11,211.35 × 10^3 m^3, respectively. The method differs from the extrapolation applied to the storage of natural gas (1.B.2.b.iii.4) for 2023 and 2024, where no suitable surrogate parameter exists. The choice between the two techniques was made separately for each subcategory on the basis of the guidance in Volume 1, Chapter 5 of the 2006 IPCC Guidelines

The recalculations did not generally involve a change in the methodological Tier. The estimates continued to be prepared predominantly using the Tier 1 approach and the applicable IPCC emission factors. Accordingly, the changes are considered primarily methodological refinements resulting from improved activity data, improved disaggregation and more accurate source allocation, rather than a methodological change. This treatment is consistent with the 2006 IPCC Guidelines and the 2019 Refinement, which define the use of improved data sources or a different level of aggregation within the same Tier as a methodological refinement.

As a result of these revisions, the current estimates for oil and natural-gas systems amount to 17,312.81 kt CO_2 eq in 2020, 19,632.81 kt CO_2 eq in 2021 and 20,093.97 kt CO_2 eq in 2022.

The recalculated years were checked for consistency with adjacent years and with the underlying oil- and gas-sector activity trends. The recalculations were applied consistently across the affected part of the time series in order to ensure that changes in reported emissions reflect changes in sectoral activity and improved underlying data rather than inconsistencies in data sources or allocation procedures.

The estimates for 2023 and 2024 represent an extension of the inventory time series and are therefore not themselves recalculations. They were compiled using the refined data structure applied in the current inventory, resulting in estimates of 19,918.33 kt CO_2 eq in 2023 and 20,559.14 kt CO_2 eq in 2024.

The activity data for venting from oil production in 2023–2024 (surrogate method) and for the storage of natural gas in 2023–2024 (extrapolation) are estimates, and replacing them with measured or operator-reported data is a priority for the next submission. When such data become available the affected years will be recalculated, and the time series will be checked so that the change of the data source does not create inconsistencies. The transition between 2019 and 2020 in refining will also be reviewed, and the revised operator data will be extended to earlier years where possible.

This approach is consistent with Volume 1, Chapter 5 of the 2006 IPCC Guidelines and the 2019 Refinement on time-series consistency, recalculations and resolution of data gaps, and with Volume 2, Chapter 4 of the 2006 IPCC Guidelines, which identifies oil- and natural-gas production statistics, throughput data and other industry information as the principal activity data required for estimating fugitive emissions.

3.3.2.1.6 PLANNED IMPROVEMENTS TO THE CATEGORY (1.B.2)

Further improvements are planned for Category 1.B.2, reflecting its importance to Azerbaijan's Energy-sector inventory and the comparatively high uncertainty associated with Tier 1 methane estimates.

Priority improvements include: obtaining more detailed activity data for oil and natural-gas exploration; abandoned wells; venting and flaring; production, processing, transmission, storage and distribution; and other currently unestimated sources; strengthening the separation of leaks, vents and flares; and improving documentation of the associated notation keys.

The feasibility of developing Tier 2 or measurement-informed emission factors will also be assessed using operator data and direct methane measurements. Particular attention will be given to information generated through leak detection and repair (LDAR), optical gas imaging, direct measurement programmes, OGMP 2.0 reporting and other methane-monitoring activities.

Satellite information, including UNEP's Methane Alert and Response System (MARS), may be used as a complementary verification tool to identify major emission events and support QA/QC, while the national GHG inventory will continue to be compiled using IPCC-consistent methods and nationally validated activity data.

3.4. Other (Fugitive emissions associated with geothermal energy production) (1.B.2.d)

This is marked with "NO" as no activities are carried out in this category in Azerbaijan.

3.5. CO_2 transportation and storage (1.C).

These sub-categories are marked with "NO" as no activities are carried out in this sub-category in Azerbaijan.

4: Industrial processes and product use (CRT sector 2)

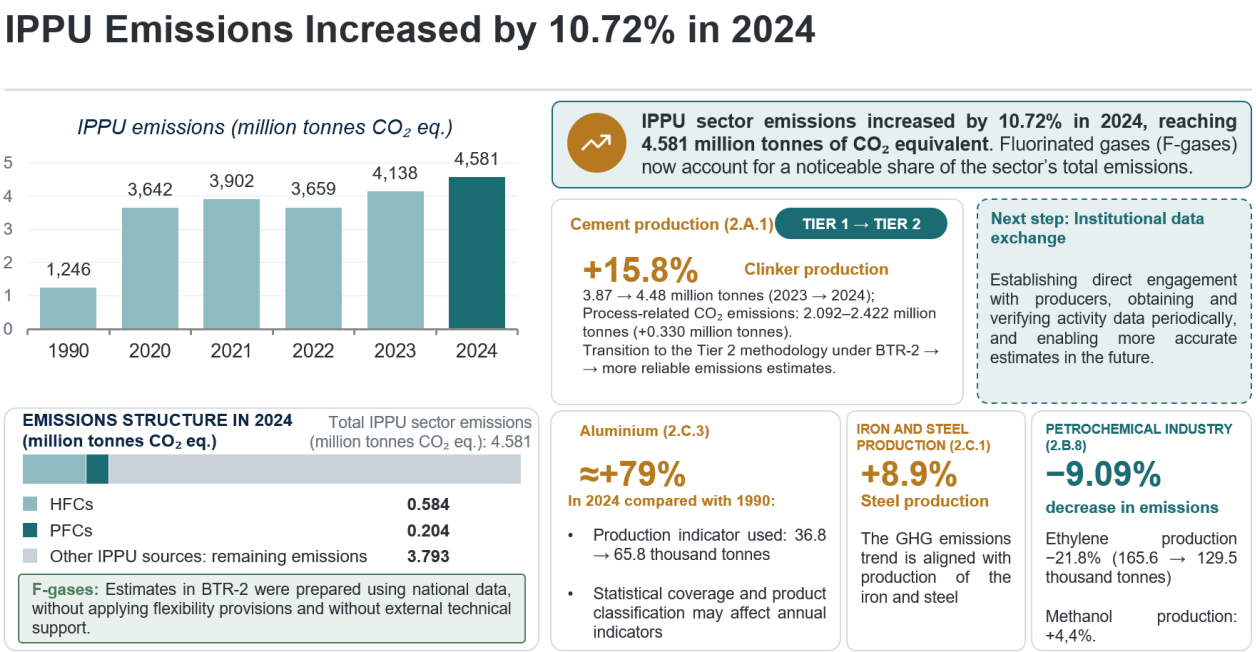
4.1. Sector overview and background information

As in most countries of the world, industrialization is one of the main priorities of economic policy in developing Azerbaijan. It was during the period of industrialization in 1945-1969 that large industrial cities such as Mingachevir and Sumgait were established in the country. Mineral refining in Dashkasan, aluminum production in Ganja and Sumgayit, and cement production in Garadagh have been commissioned.

In the 70s and 80s of the last century, large amounts of funds were directed to the development of the industry, a number of large industrial enterprises were established, the diversification of the industry was accelerated, and its structure was improved. During this period, the largest steel casting plant in the South Caucasus, Baku domestic air conditioners, electronic products production in Ganja, factories specializing in the production of household compressors, integrated microcircuits in Sumgayit, and the largest Baku Deep Insulation Plant began to operate.

The restoration of political and economic stability in the country starting from 1997 gave a new breath to the development of industrial production. Rapid industrial growth has been observed in Azerbaijan since 2003, and purposeful measures have been taken to solve energy supply issues, which are vital for industrial production. As a result of the works, the industry has entered a new stage of development.

The Industrial Processes and Product Use (IPPU) sector in Azerbaijan covers greenhouse gas emissions from industrial processes, the use of products, and the use of carbon in combustible natural resources for non-energy purposes. Industrial Processes and Products Use includes greenhouse gas emissions from industrial processes, product use, and non-energy use of carbon in combustible natural resources.



4.1.1. Categories and total emissions

The Industrial Processes and Product Uses (IPPUs) sector covers GHG emissions from industrial processes, products and non-energy uses of carbon in combustible natural resources.

Emissions in this sector occur during the following activities:

- chemical or physical transformations associated with the production of mineral, chemical and metal products, including cement, lime, glass, ceramics and metals;
- the use of fossil fuels for purposes other than energy production, including the use of lubricants; and

- the use of products containing fluorinated greenhouse gases, including HFCs used as substitutes for ozone-depleting substances.

In Azerbaijan, GHG emissions are reported under the following principal IPPU categories: Mineral Industry (2.A), Chemical Industry (2.B), Metal Industry (2.C), Non-Energy Products from Fuels and Solvent Use (2.D), and Product Uses as Substitutes for Ozone-Depleting Substances (2.F).

An important improvement in the current inventory cycle is the enhanced completeness of F-gas reporting. Unlike the previous inventory submission, Azerbaijan did not apply the flexibility previously used for the estimation of emissions under category 2.F. Emissions from Product Uses as Substitutes for Ozone-Depleting Substances (2.F) have been estimated and included in the current inventory, improving the completeness of the IPPU sector and the consistency of the reported time series.

Total GHG emissions from the IPPU sector are expressed in CO_2-equivalent (CO_2-eq) using the 100-year global warming potential values from the IPCC Fifth Assessment Report (AR5) and include all greenhouse gases estimated under the applicable IPPU categories.

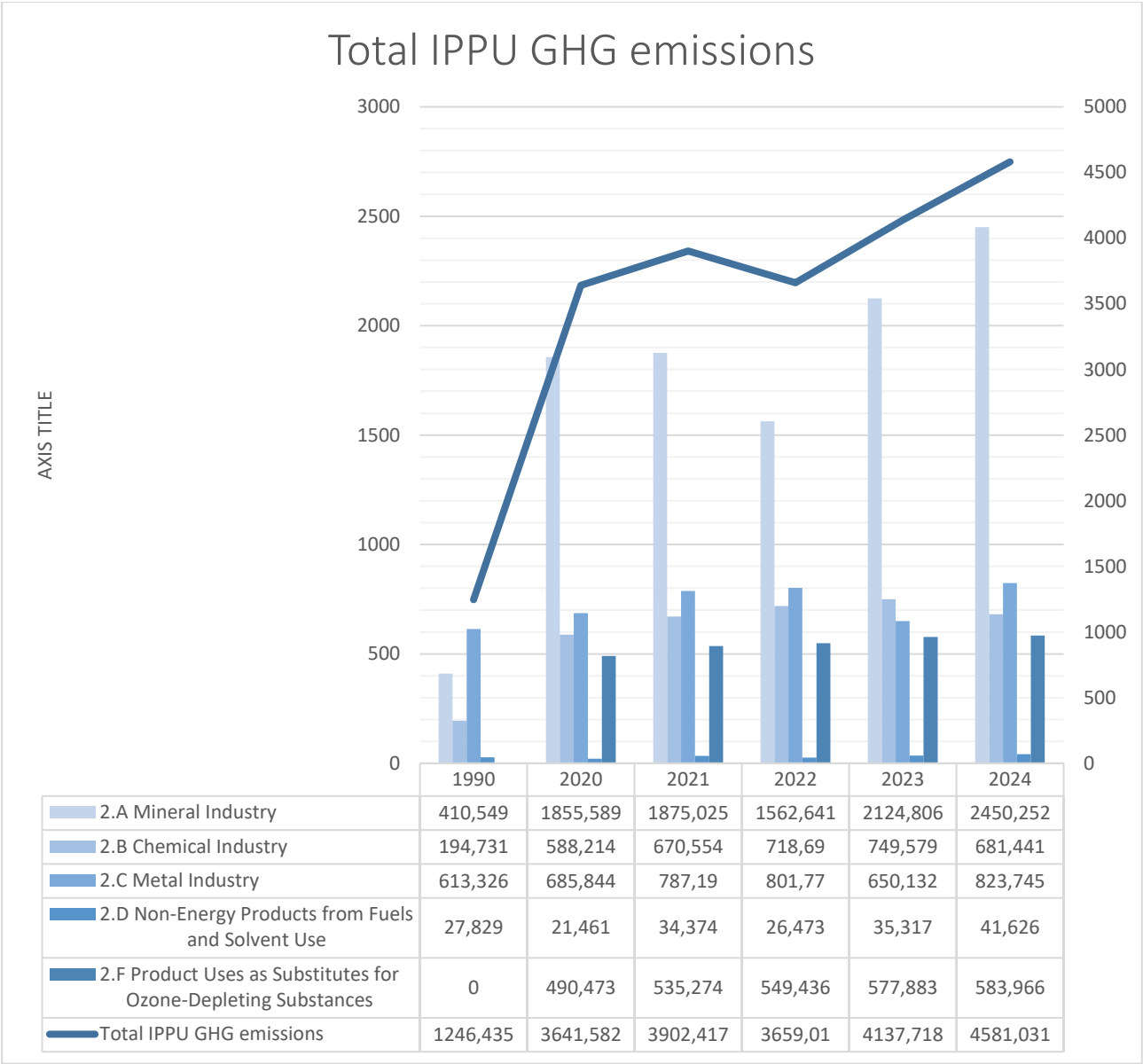
Total IPPU GHG emissions increased from 1,246.424 Gg CO_2-eq in 1990 to 4,581.018 Gg CO_2-eq in 2024, representing an increase of approximately 268%. During the recent inventory period, emissions increased from 3,641.571 Gg CO_2-eq in 2020 to 3,902.413 Gg CO_2-eq in 2021, decreased to 3,659.000 Gg CO_2-eq in 2022, and subsequently increased to 4,137.631 Gg CO_2-eq in 2023 and 4,581.018 Gg CO_2-eq in 2024, the highest level during the 2020–2024 period.

Gas	1990	2020	2021	2022	2023	2024
CO_2	1,239.341	2,944.505	3,133.894	2,929.399	3,400.157	3,749.142
CH_4	7.011	39.743	38.924	46.574	45.839	44.141
N_2O	NE	NE	NE	NE	NE	NE
HFCs	NE	490.383	535.184	549.346	577.835	583.966
PFCs	0.083	166.951	194.415	133.691	113.887	203.782
Total IPPU GHG emissions	1,246.435	3,641.582	3,902.417	3,659.010	4,137.718	4,581.031

Table 26. IPPU GHG emissions by gas, 1990 and 2020–2024 (Gg CO_2-eq)

Compared with 1990, total IPPU GHG emissions in 2024 were approximately 3.7 times higher. For the recent inventory period, emissions increased from 2020 to 2021, decreased in 2022, and subsequently increased in 2023 and 2024, reaching the highest level of the 2020–2024 period in 2024.

In 2024, CO_2 remained the dominant greenhouse gas in the IPPU sector, accounting for 3,749.142 Gg CO_2-eq, or approximately 81.8% of total IPPU emissions. HFCs contributed 583.966 Gg CO_2-eq (12.7%), PFCs 203.782 Gg CO_2-eq (4.4%), and CH_4 44.128 Gg CO_2-eq (1.0%). HFCs and PFCs together accounted for approximately 17.2% of total IPPU GHG emissions in 2024.



	1990	2020	2021	2022	2023	2024
2.A Mineral Industry	410,549	1855,589	1875,025	1562,641	2124,806	2450,252
2.B Chemical Industry	194,731	588,214	670,554	718,69	749,579	681,441
2.C Metal Industry	613,326	685,844	787,19	801,77	650,132	823,745
2.D Non-Energy Products from Fuels and Solvent Use	27,829	21,461	34,374	26,473	35,317	41,626
2.F Product Uses as Substitutes for Ozone-Depleting Substances	0	490,473	535,274	549,436	577,883	583,966
Total IPPU GHG emissions	1246,435	3641,582	3902,417	3659,01	4137,718	4581,031

Figure 41. IPPU GHG emissions by category, 1990 and 2020–2024 (Gg CO_2-eq)

Category	1990	2020	2021	2022	2023	2024
2.A Mineral Industry	410.549	1,855.589	1,875.025	1,562.641	2,124.806	2,450.252
2.B Chemical Industry	194.731	588.214	670.554	718.690	749.579	681.441
2.C Metal Industry	613.326	685.844	787.190	801.770	650.132	823.745
2.D Non-Energy Products from Fuels and Solvent Use	27.829	21.461	34.374	26.473	35.317	41.626
2.F Product Uses as Substitutes	NE	490.473	535.274	549.436	577.883	583.966

for Ozone-Depleting Substances						
Total IPPU GHG emissions	**1,246.435**	**3,641.582**	**3,902.417**	**3,659.010**	**4,137.718**	**4,581.031**

Table 27. IPPU GHG emissions by category, 1990 and 2020–2024 (Gg CO_2-eq)

In 2024, Mineral Industry (2.A) was the largest source of IPPU emissions, accounting for approximately 53.5% of the sector total, followed by Metal Industry (2.C) at 18.0%, Chemical Industry (2.B) at 14.9%, Product Uses as Substitutes for Ozone-Depleting Substances (2.F) at 12.7%, and Non-Energy Products from Fuels and Solvent Use (2.D) at 0.9%.

Indicators	1990	2020	2021	2022	2023	2024
Energy	90.3	70.0	78.6	79.6	79.6	78.5
IPPU	1.4	5.3	5.3	4.8	5.3	6.0
Agriculture	5.1	10.6	9.5	8.9	8.6	8.6
Waste	3.1	7.1	6.8	6.7	6.6	6.9
Total emissions	**100**	**100**	**100**	**100**	**100**	**100**

Table 28. Share of sectors in the amount of GHG emissions, %

As can be seen from the table, the share of the sector in the country's total emissions in 1990 was 1.4%, and in 2024 it was 6.0%.

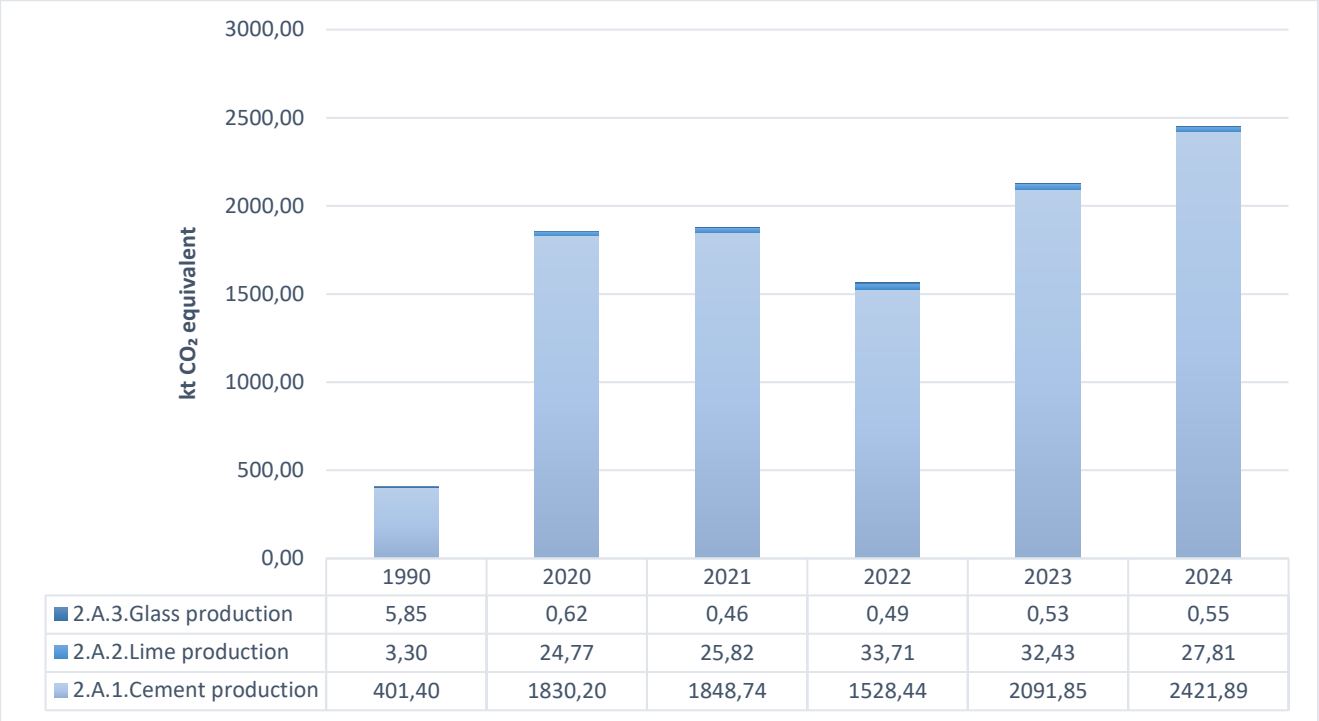
4.1.2. Mineral industry (2.A)

CRT category 2.A Mineral industry is divided into subcategories 2.A.1 to 2.A.4. These categories include:

- cement production (2.A.1.)
- lime production (2.A.2.)
- glass production (2.A.3)
- ceramic production (2.A.4.a)

The mineral industry produces CO_2 emissions primarily from the calcination of carbonate raw materials used in mineral production. CO_2 is the principal greenhouse gas reported under this category.The main emission from the mineral production category is CO_2.

Emissions from Other Process Uses of Carbonates (2.A.4), including other uses of soda ash (2.A.4.b), non-metallurgical magnesia production (2.A.4.c), and other uses of limestone and dolomite (2.A.4.d), were not estimated where the corresponding activities do not occur in Azerbaijan. These categories are reported as “NO” in the respective CRTs, where applicable.



	1990	2020	2021	2022	2023	2024
2.A.3.Glass production	5,85	0,62	0,46	0,49	0,53	0,55
2.A.2.Lime production	3,30	24,77	25,82	33,71	32,43	27,81
2.A.1.Cement production	401,40	1830,20	1848,74	1528,44	2091,85	2421,89

Figure 42. GHG emissions from Mineral Industry category

4.1.2.1. CEMENT PRODUCTION (2.A.1)

The cement production category in the IPPU sector in Azerbaijan is not the key category for CO2 emissions in terms of emission level and trend. CO_2 is produced during the production of Portland clinker, an intermediate product in cement production. The production of cement in Azerbaijan currently occurs within four cement plants, which has grown from 1990 when only one plant was in operation.

Table 29 presents cement production statistics for 1990 and 2020–2024 and clinker production statistics used for emission estimation for 2020–2024. For 1990, cement production of 990,000 tonnes was obtained from the national historical publication History of Azerbaijan, 1941–2002-ci years, Volume VII[6] (Azerbaijan National Academy of Sciences, A. Bakikhanov Institute of History, 2008). The value is also consistent with the cement production reported for 1990 in Azerbaijan's Second National Communication to the UNFCCC.

c	1990	2020	2021	2022	2023	2024
Cement production (t)	990,000	3,237,100	3,438,700	3,561,200	3,963,200	4,074,700
Clinker Production (t)	742,500	3,385,500	3,419,800	2,827,300	3,869,500	4,480,000

Table 29. Cement and clinker production in Azerbaijan, tonnes

*1990 clinker production is estimated from cement production using a 75% clinker fraction; it is not a direct statistical observation.

4.1.2.1.1. METHODOLOGICAL ISSUES (2.A.1)

Emissions for 2020–2024 were calculated according to the Tier 2 method in the IPCC Guidelines (IPCC (2006a): Vol. 3, Chapter 2.2.1.1, Equation 2.2).

The activity data used in the calculation for 1990 is "cement production" (tons) as determined by the SSC. Production statistics for 1990 are available only at the country-wide level and are presented as a grand total by summing up production figures for individual plants. Thus, the total

[6] https://anl.az/el/Kitab/254507.pdf

clinker production statistics required for emission estimation are obtained from the total cement production using the standard clinker fraction of cement (75%) according to the IPCC guidelines. Previously, information on the amount of clinker imported from abroad was provided in the SSC, and this approach was used in the First National Communications of Azerbaijan. The estimated clinker production was 742,500 tonnes, based on cement production of 990,000 tonnes.

The activity data used in the calculation for 2020-2024 are official clinker production data (tonnes) provided by the State Statistical Committee (SSC). The availability of direct clinker production data for 2020–2024 eliminates the need to estimate clinker production from aggregate cement production using a default clinker fraction.

A clinker emission factor of 0.53 t CO_2/t clinker was applied. In accordance with the 2006 IPCC Guidelines, this emission factor corresponds to a clinker CaO content of approximately 67%. The emission factor is uncorrected for cement kiln dust (CKD). The IPCC default CKD correction factor of 1.02 was therefore applied, resulting in an effective emission factor of 0.5406 t CO_2/t clinker.

Accordingly, emissions for 2020–2024 were calculated as:

$$CO_2 \text{ emissions (t)} = \text{Clinker production (t)} \times 0.53 \times 1.02$$

As can be seen from Figure 42, emissions follow the annual variation in clinker production, decreasing in 2022 and subsequently increasing in 2023 and 2024.

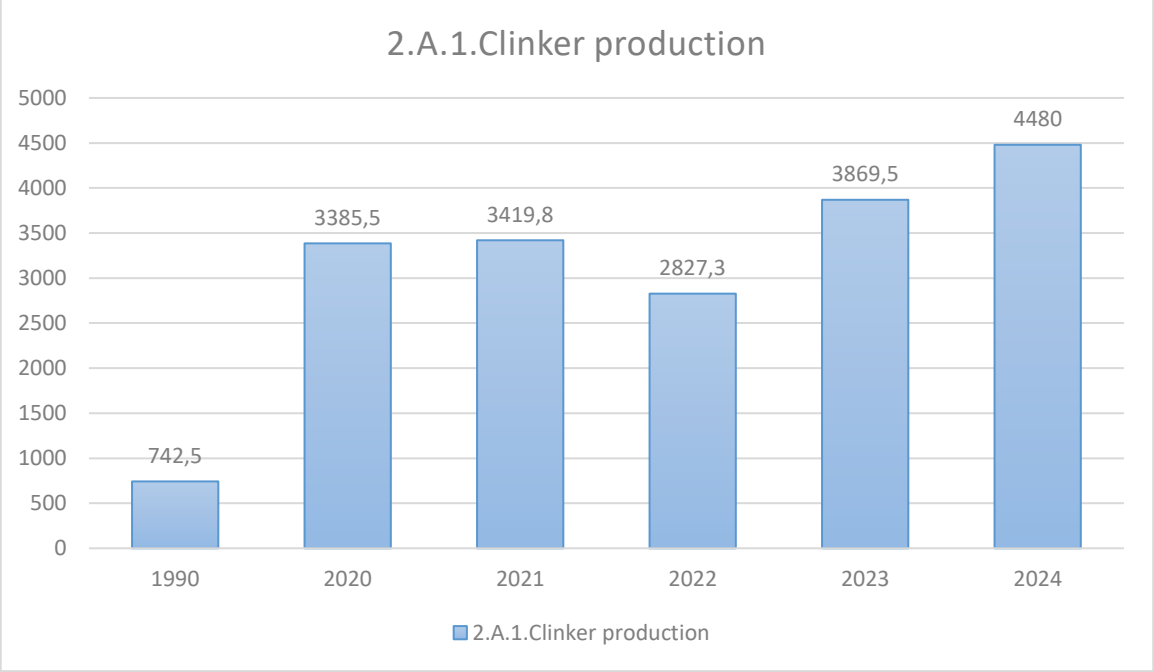


Figure 42. GHG emissions from Clinker production processes, kt CO_2 eq.

4.1.2.1.2. UNCERTAINTIES AND CONSISTENCY OF TIME SERIES (2.A.1)

Consistency in the time series for 2020–2024 is achieved through the consistent use of direct clinker production data and the same emission factor and CKD correction factor.

Under the Tier 2 methodology, the main sources of uncertainty relate to clinker production data, clinker CaO content and the CKD correction factor. For 1990, additional uncertainty arises from estimating clinker production from aggregate cement production rather than using direct clinker production data.

The uncertainty associated with the 1990 activity data is therefore higher than for 2020–2024. Where clinker production is estimated from cement production, the uncertainty may be substantially greater than when direct clinker production data are available, and this is reflected in the inventory uncertainty assessment.

Uncertainties in the emission factor for Tier 1, the major uncertainty component is the clinker fraction of the cement(s) produced which was applied for the 1990 estimates. As import and export data are not available within Azerbaijan for 1990, then the uncertainty of the clinker production estimate is considered to be high. The default uncertainty range given by the IPCC when using the assumption that 95% clinker factor in portland cement is ±2-7%. The upper range has been selected for use in the uncertainty assessment.

The uncertainty in the activity data is driven by the need to estimate clinker production data from cement production statistics. The IPCC estimates that where clinker production data are estimated from cement production, the uncertainty of the activity data can be as high as about 35 percent, therefore this value has been used in the uncertainty assessment.

4.1.2.1.3. QUALITY ASSURANCE/ QUALITY CONTROL AND VERIFICATION (2.A.1)

Since the QA/QC plan was not ready, quality control and quality assurance for the cement category was carried out by an independent expert within the general procedures of QA/QC IPCC 2006.

All data used for quality assurance were cross-checked for reliability against comparative data from the SSC. Those materials were accepted as evidence by the inspection team. The emission factor applied to clinker production was checked against the corresponding IPCC methodological guidance. Historical activity data were also reviewed against available national sources; this review identified 990,000 tonnes as the documented cement production value for 1990.As a result of expert assessment, the same figure was used for all relevant years during that period.

4.1.2.1.4. RECALCULATIONS BY CATEGORY (2.A.1)

Emissions have been recalculated for 1990 and 2020–2024. For 2020–2024, the recalculation follows the availability of official clinker production data from the SSC and applies the Tier 2 methodology using direct clinker production data, a clinker emission factor of 0.53 t CO_2/t clinker and the IPCC default CKD correction factor of 1.02. This replaces the previous approach of estimating clinker production from cement production using a default clinker fraction.

For 1990, the activity data were revised following verification of historical cement production data. Cement production of 990,000 tonnes, reported in the national historical publication History of Azerbaijan, 1941–2002-ci years, Volume VII[7] (Azerbaijan National Academy of Sciences, A. Bakikhanov Institute of History, 2008), was used in place of the previously reported 792,000 tonnes, resulting in recalculated emissions of 401.399 Gg CO_2. The 990,000-tonne value is also consistent with Azerbaijan's Second National Communication to the UNFCCC. The 1990 emission estimate was recalculated accordingly.

4.1.2.1.5. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.A.1)

Improvements are planned in this category to reduce uncertainty in performance data and improve the accuracy of Tier 1 emission calculations for cement production. It is planned to impose new obligations on all enterprises, including cement plants, to submit activity data at the facility level. In this way, Azerbaijan hopes to collect information on facility-level clinker production to eliminate the demand for clinker production to be diverted from cement production. Data on clinker imports and exports will also be collected to ensure that emissions from exported clinker production are taken into account in the national emissions assessment.

Improvements are planned in this category to further reduce uncertainty and improve the accuracy of Tier 2 emission estimates. Future improvements will focus on obtaining more detailed information on clinker composition, including CaO content, and country-specific information on CKD where available.

4.1.2.2. LIME PRODUCTION (2.A.2)

In lime production, CO_2 emissions are released into the atmosphere mainly during calcination processes where limestone (CaCO3) is heated to produce lime (CaO) and release CO_2. 2.A.2 The following statements refer only to the quantities of quicklime and dolomite lime produced in lime plants. Information on other sectors using limestone is provided in the relevant reporting tables (CRT 2.A.4d). Lime production in the country has increased over time as shown in Table 28.

[7] https://anl.az/el/Kitab/254507.pdf

Lime production	1990	2020	2021	2022	2023	2024
Quicklime / high-calcium lime		22,913.7	22,496.2	33,732.1	35,651.4	19,602.7
Hydrated (slaked) lime		6,257.5	8,271.4	7,465.3	4,224.1	5,299.1
Hydraulic lime		5,139.0	4,969.0	5,058.0	4,431.5	15,683.9
Total lime production	4,400.0	34,310.2	35,736.6	46,255.4	44,307.0	40,585.7

Table 30. Lime production in Azerbaijan, tons

CO_2 emissions from lime production increased substantially compared with the 1990 level, reflecting the increase in lime production. Among the recent inventory years, emissions reached their highest level in 2022 and subsequently decreased to 27.811 Gg CO_2 in 2024.

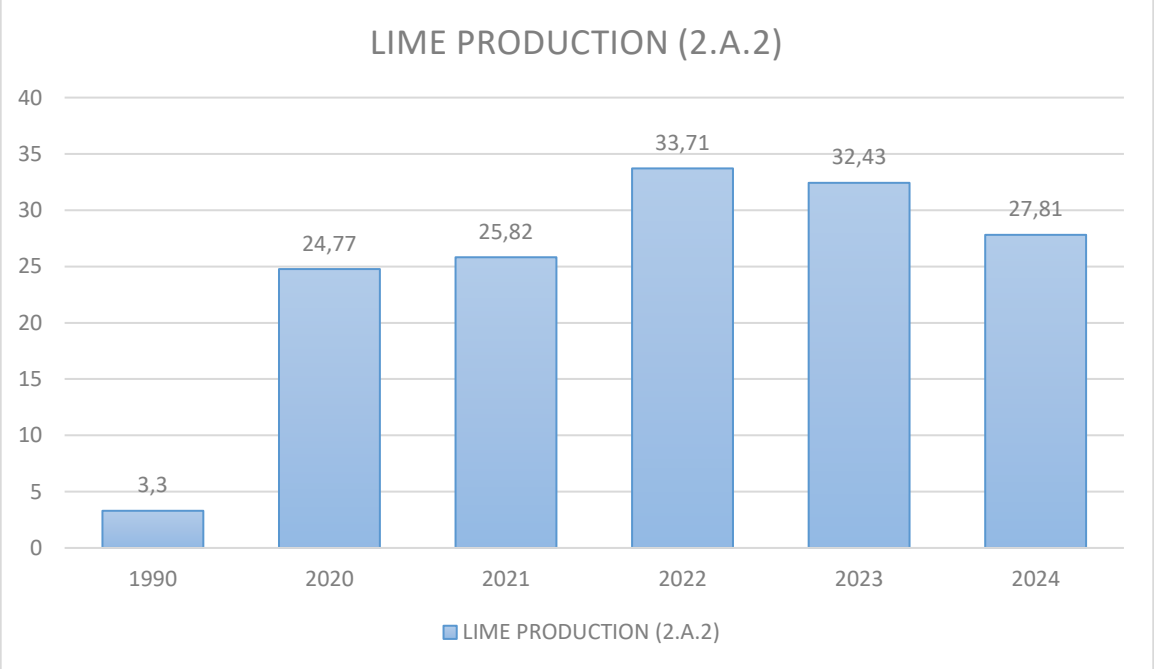


Figure 43. GHG emissions from Lime production processes, kt CO_2 eq.

4.1.2.2.1. METHODOLOGICAL ISSUES (CRT. 2.A.2)

Emissions from lime production in Azerbaijan were calculated using the Tier 1 method given in the IPCC Guidelines (IPCC (2006a): Volume 3, Chapter 2.3.1.1).

The corresponding emission level is obtained by multiplying the quantity of the product in question (lime or dolomite lime) by the corresponding emission factor. For 1990, only aggregate lime production data were available which was obtained from the SSC. Therefore, the available total lime production of 4,400 tonnes was used to estimate emissions using a default emission factor of 0.75 t CO_2/t lime. For 2020–2024, national lime production statistics provided by the State Statistical Committee (SSC) were available at a more disaggregated level, distinguishing quicklime, hydrated (slaked) lime and hydraulic lime. The disaggregated activity data were used separately in the emission calculations. An emission factor of 0.75 t CO_2/t lime was applied to quicklime, treated as high-calcium lime for estimation purposes; 0.7275 t CO_2/t lime was applied to hydrated lime; and 0.59 t CO_2/t lime was applied to hydraulic lime. The emission factor used for hydrated lime was derived by applying a hydration correction factor of 0.97 to the high-calcium lime emission factor (0.75 × 0.97 = 0.7275 t CO_2/t lime).

Emissions for each lime type were calculated separately and summed to obtain total annual CO_2 emissions from lime production. This represents an improvement compared with the previous approach, under which aggregate lime production was estimated using a single emission factor of 0.75 t CO_2/t lime.

4.1.2.2.2. Uncertainties and time series (2.A.2)

Consistency in the time series was assessed taking into account the availability and level of disaggregation of activity data for different inventory years.

For 2020–2024, the availability of disaggregated national production statistics by lime product type improved the characterization of activity data compared with the previous aggregate approach. Uncertainty remains regarding the composition of the reported lime products, including their CaO and MgO content. For 1990, disaggregated production data by lime type were not available and the estimate was based on aggregate lime production data. Uncertainties for the activity data used here are estimated to be ±10% as data used are national production statistics.

4.1.2.2.3. CATEGORY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL (2.A.2)

Quality control and quality assurance were performed as part of the overall inventory QA/QC procedures.

Activity data and emission estimates were checked for consistency across the time series and against the national production statistics used in the inventory. For 2020–2024, the disaggregated activity data were also checked against the corresponding annual total lime production values.

4.1.2.2.4. RECALCULATIONS BY CATEGORY (2.A.2)

Emissions from lime production were recalculated for 2020–2024 following the availability of more disaggregated national production statistics from the SSC. In the previous inventory, emissions were estimated using aggregate lime production data and a single default emission factor of 0.75 t CO_2/t lime. For the current inventory, production data for 2020–2024 were disaggregated into quicklime, hydrated (slaked) lime and hydraulic lime, and the corresponding emission factors of 0.75, 0.7275 and 0.59 t CO_2/t lime, respectively, were applied.

As a result of the recalculation, CO_2 emissions from lime production were estimated at 24.770 Gg in 2020, 25.821 Gg in 2021, 33.714 Gg in 2022, 32.426 Gg in 2023 and 27.811 Gg in 2024. The recalculation therefore reflects an improvement in the level of disaggregation of activity data and the application of differentiated emission factors according to the reported lime product type.

For 1990, disaggregated production data by lime type were not available. The recalculated estimate for 1990 therefore continues to rely on the available aggregate lime production of 4,400 tonnes and the default emission factor of 0.75 t CO_2/t lime.

4.1.2.2.5 *CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.A.2)*

Further improvements are planned to reduce uncertainty and strengthen the characterization of lime production, including clarification of the composition of the reported lime products. Further efforts will need to be focused on assessing the completeness of activity data, including lime produced and consumed internally by industrial facilities (“non-marketed” lime), where relevant. This may require surveys of lime production facilities and other facilities that produce lime for their own consumption, as collecting data on non-marketed lime production remains challenging in the absence of facility-level reporting.

4.1.2.3. GLASS PRODUCTION (2.A.3)

The statistical data of SSC on glass products in the country cover the years 2000-2025. The glass industry of Azerbaijan produces different types of glass with different chemical composition. In 2019, "ASK Glass" LLC produced 36 types of glass products. In 2020, the company expanded its product range and succeeded in producing 61 types of products.

The glass industry of Azerbaijan produces different types of glass with different chemical composition. The main glass raw materials emitting CO_2 during the melting process were limestone (CaCO3), dolomite (CaMg (CO3)2) and soda ash (Na2CO3). .

For 1990, glass production was substantially higher than in the subsequent inventory years, reflecting the comparatively larger scale of industrial activity during that period. In the absence of a complete and sufficiently detailed historical statistical series, an activity-data figure of 58,539.7 tonnes was adopted on the basis of expert judgement, taking into account the historical context of glass manufacturing in Azerbaijan. This figure is retained in the current inventory. In the next reporting cycle, the glass production estimates will be revisited as part of a more detailed

assessment of glass production, including the examination of available information on individual manufacturing facilities and product categories.

The information of the SSC was used for activity data. It publishes data on glass production as shown in Table 30

Years	1990	2020	2021	2022	2023	2024
Glass production	58,539.7	6,180.3	4,596.5	4,885.4	5,285.9	5,535.3

Table 31. Glass production in Azerbaijan, tons

In addition to total glass-product production expressed in tonnes, the SSC publishes a separate indicator covering kitchen, laboratory and other similar glassware, expressed in million units. Furthermore, more detailed SSC statistics provide production information for individual glass-product categories. For the 2023 reporting year, these data include glass jars and related products, other glass containers, mechanically processed glassware and glass in bulk. The reported quantities are expressed in different units, including tonnes, units and thousands of units.

The additional product-level statistics provide a more detailed picture of the range of glass products manufactured in the country. However, because the data are reported using different units and may cover different stages of glass manufacturing and processing, they cannot be directly aggregated or converted into tonnes without further assessment. Their relationship with the aggregate glass-production indicator will therefore be examined in the next reporting cycle to improve the completeness and consistency of the activity data and avoid possible double counting.

Other SSC statistics on the production of construction materials also contain information on float glass, multilayer glass, mirrors and other glass products. These data are reported in square metres, kilograms or tonnes. As the year headings for the relevant statistical columns are not available in the extracted material, the observations have not been assigned to specific inventory years or incorporated into the current time series.

Using this approach, emissions from glass production were estimated at 5.854 Gg CO_2 in 1990, 0.618 Gg in 2020, 0.460 Gg in 2021, 0.489 Gg in 2022, 0.529 Gg in 2023 and 0.554 Gg in 2024. The 1990 emission estimate is based on the activity-data figure adopted on the basis of expert judgement, as described above.

The additional product-level statistics and the indicator for kitchen, laboratory and other similar glassware were not incorporated separately into the current calculations. Further examination is required to establish their relationship with the aggregate production data and determine whether they can support a more detailed estimation approach.

4.1.2.3.1. METHODOLOGICAL ISSUES (CRT. 2.A.3)

As glass production values in Azerbaijan are only available at the national level and are not disaggregated by type of glass produced, carbonates used in processing or production, emissions from glass production are calculated using the Tier 1 method given in the IPCC Guidelines (IPCC (2006a): Vol. 3, Chapter 2.4.1.1) calculated. Therefore, the total values of glass production are multiplied by a standard emission factor based on a "typical" raw material mix (0.20 tons CO_2/ton glass).

Since glass manufacturers in practice use recycled glass cullet in production, in addition to the raw material, the cost of glass cullet was additionally applied to the assessment according to the Tier 1 method. The IPCC 2006 guidelines state that the proportion of glass scrap (the fraction of furnace charge represented by scrap) for container applications, which constitute the bulk of glass production, will be in the range of 0.4-0.6. Since there is no additional information on the use of glass scraps in glass production enterprises in Azerbaijan, the midpoint of this mentioned range was used in the emission calculation.

4.1.2.3.2. UNCERTAINTIES AND TIME SERIES (2.A.3.)

The methodology used to calculate emissions from glass production is the same for all time series, but activity data provided by Azerbaijan's DSC show very high glass production figures compared to the most recent years in the time series. It is believed that this is related to the integration of Azerbaijan into the centralized industrial system of the Soviet Union in 1990. Azerbaijan's glass factories were part of a large network that supplied glass to various regions within the USSR. After the collapse of the Soviet Union in 1991, the country faced economic difficulties, which led to a decline in industrial output, including glass production. Aging infrastructure, lack of investment and shift to the oil and gas sector further weakened the glass industry. At present, Azerbaijan's glass production is lower than in 1990, and is primarily directed to domestic consumption.

The 1990 activity-data figure of 58,539.7 tonnes was adopted on the basis of expert judgement, taking into account the substantially higher level of glass-production activity during that period. Given the differences in the structure and scale of industrial production between 1990 and subsequent years, this historical estimate will be revisited in the next reporting cycle as part of a more detailed assessment of glass production.

In addition, statistics on the glass sector in the country are incomplete, and there is no information on the sector's use of raw materials. Data on these activities are subject to statistical confidentiality and cannot be obtained from statistical balance sheets, and therefore it is estimated that uncertainty in activity data may exceed ± 10%.

Since it is not possible to divide the total volume of glass production by glass type, default emission factors were used for emission estimation. The IPCC 2006 Guidelines state that in such cases the uncertainty can be +/- 60%.

4.1.2.3.3. QUALITY ASSURANCE/QUALITY CONTROL (2.A.3.)

Since the planned plan for QA/QC was not ready, quality control and quality assurance work was carried out by a relevant independent expert involved in the general measures of the glass category of the industrial sector in accordance with the requirements of the IPCC 2006 guidelines and related documents.

The activity data and applied emission factor assumptions were reviewed as part of the general inventory quality-control procedures. The availability of more detailed SSC product-level statistics was also considered in identifying opportunities for improving the completeness and consistency of activity data in subsequent reporting cycles.

4.1.2.3.4. RECALCULATIONS BY CATEGORY (2.A.3)

The more detailed SSC product-level information was reviewed as an additional source of information for improving the activity-data assessment. However, it was not separately incorporated into the current emission calculations because the product categories are reported in different units and their relationship with the aggregate glass-production series requires further clarification.

4.1.2.3.5. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.A.3)

Improvements are planned in this category to improve the accuracy of Tier 1 emission estimates for glass production by reducing uncertainties in activity data and collecting production statistics by type of glass production. This will be done in connection with relevant facilities within Azerbaijan. Disaggregated data by type of glass production and data on the different emission factors used by establishments will enable the reporting of emissions from glass production using the Tier 2 methodology.

In particular, a dedicated technical project is envisaged to support a more comprehensive assessment of the glass industry and the further development of the relevant inventory estimates. The current inventory has been prepared using the available national statistical information and within the scope, timeframe and resources of the inventory preparation process. A more detailed investigation, involving systematic collection and reconciliation of historical and current production data, assessment of individual manufacturing facilities and examination of product-specific characteristics, would benefit from a separately designed and adequately resourced project implemented in cooperation with the relevant national institutions and industrial enterprises.

A dedicated technical project is needed to support a more comprehensive assessment of the glass industry and further improve the accuracy and completeness of the related GHG inventory estimates. The current inventory has been prepared using the available national statistical information and within the scope, timeframe and resources of the inventory preparation process. A more detailed investigation, involving systematic collection and reconciliation of historical and current production data, assessment of individual manufacturing facilities and examination of product-specific characteristics, requires dedicated technical and financial resources. Such a project should be implemented in cooperation with the relevant national institutions and industrial enterprises, drawing on national expertise and specialised technical support.

Further work will focus on revisiting the 1990 activity-data estimate as part of a more detailed historical assessment of glass production. This will include examining available statistical information on the production volumes of individual glass-manufacturing facilities operating in Azerbaijan during that period and assessing the contribution of different glass-product categories. The purpose will be to further substantiate and refine the historical estimate, taking into account the industrial structure and production characteristics of the period.

In addition, the detailed SSC statistics on glass containers, glassware, glass in bulk, float glass, multilayer glass, mirrors and other glass products will be examined to establish their statistical coverage and relationship with the aggregate glass-production indicator. Particular attention will be given to reconciling the different measurement units and distinguishing primary glass production from the processing and manufacture of finished glass products. The indicator for kitchen, laboratory and other similar glassware, expressed in million units, will also be assessed to determine whether a reliable conversion or complementary estimation approach can be developed.

Further improvements will also focus on obtaining information on the raw-material composition of glass, the use of recycled glass cullet and, where available, facility-specific emission factors. These improvements are expected to reduce uncertainties in activity data and emission estimates and enhance the transparency and accuracy of future inventory submissions.

4.1.2.4. CERAMICS (2.A.4.A)

The ceramic industry of Azerbaijan is as diverse as the glass industry. Different products with different chemical compositions are produced for many different applications. Clay (the main raw material), sand and other natural raw material mixtures are also used in the country's ceramic industry. In the ceramic sector of Azerbaijan, bricks, tiles, floor and wall tiles, ceramic tableware, etc. is produced. In the processes considered here, CO_2 emissions are released into the atmosphere during the combustion processes in furnaces.

The IPCC guidelines have two main methodologies for estimating emissions from carbonate use for this category. For this category, IPCC Tier 1 assumes that limestone and dolomite are used as carbonate feedstocks and is adjusted to use the standard ratio of limestone to dolomite. Since national statistics do not provide this information on the ceramics industry, emissions from this category were not assessed in this GHG inventory and were not included in the national GHG report. Therefore, the category Ceramics in the mineral industry (2.A.4.a) has not been assessed for GHG emissions and is marked as "NE".

4.1.2.4.1. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.A.4.A)

The IPCC 2006 Guidelines require activity data for calculating process-related CO_2 emissions for the ceramics industry. (IPCC (2006a): Volume 3, As noted, no GHG inventory has been conducted in this category as the available statistics do not meet the requirements of the IPCC guidelines.

In this regard, improvements are envisaged in the area of adaptation of the existing statistical data of the SSC to the requirements of the IPCC guidelines in the ceramics category. Improvements are expected to be completed in the development processes of the 2nd BTR. In that period, appropriate measures will be taken to reflect the amount of carbonate raw materials (limestone, dolomite, etc.) consumed per product unit in the production processes of the mentioned category.

4.1.3. Chemical industry (2.B)

Category 2.B includes production of ammonia (2.B.1), production of nitric acid (2.B.2), production of adipic acid (2.B.3), production of caprolactam, glyoxal and glyoxylic acid, (2.B. 4), carbide production (2.B.5), titanium dioxide production (2.B.6), soda ash production (2.B.7), petrochemical

and black carbon production (2.B.8) and includes the production of fluorine chemicals (2.B.9). In the other (2.B.10) category, only precursor substances obtained from the production of fertilizers and sulfuric acid are studied. There are only 2 of these activities occurring in Azerbaijan: production of methanol and ethylene, both of which are reported under petrochemical and black carbon production (2.B.8).

The activities identified and quantified in Azerbaijan under this sector are methanol and ethylene production, both reported under category 2.B.8 (Petrochemical and carbon black production). These processes generate CO_2 and CH_4 emissions.

4.1.3.1. PETROCHEMICAL AND BLACK CARBON PRODUCTION (2.B.8)

The petrochemical sector produces basic organic chemicals that are processed from natural gas and oil fractions into various intermediates and end products (mainly polymers). According to section 2.B.8 of the 2006 IPCC Guidelines (IPCC, 2006a), the main chemicals are (a) methanol, (b) ethylene, (c) ethylene chloride and vinyl chloride, (d) ethylene oxide, and (e) is acrylonitrile.

Among the activities in this category in Azerbaijan, there is only methanol and ethylene production, which emits both CO_2 and methane emissions.

Years	1990	2020	2021	2022	2023	2024
Methanol production	NO	476,600	378,100	534,500	494,600	516,500
Ethylene production	83,468	102,100	168,400	139,800	165,600	129,500

Table 32. Petrochemical production in Azerbaijan, tons

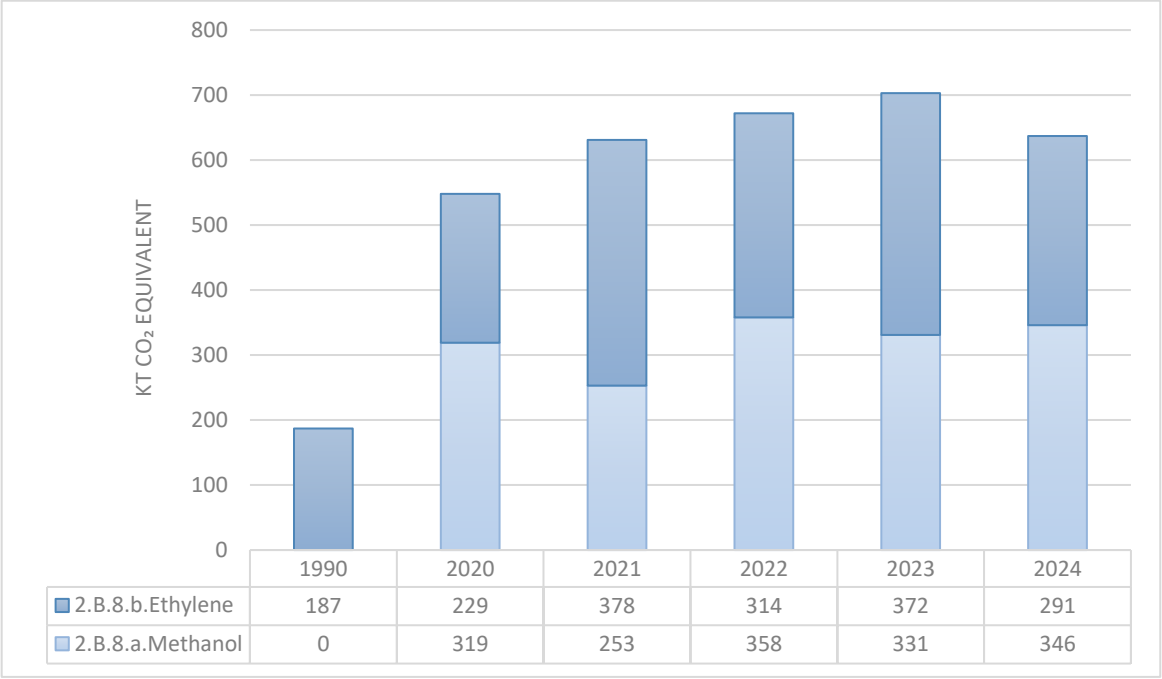


Figure 44. GHG emissions in Chemical industry, kt CO_2 eq.

According to the latest estimates, total GHG emissions from category 2.B.8 decreased by 0.068 Mt CO_2-eq (9.09%) between 2023 and 2024. This decrease was primarily driven by a 21.8% reduction in ethylene production, from 165,600 to 129,500 tonnes. Methanol production increased by 4.4%, from 494,600 to 516,500 tonnes, partially offsetting the reduction in emissions associated with lower ethylene production.

4.1.3.1.1. METHODOLOGICAL ISSUES (2.B.8 PETROCHEMISTRY)

Emissions for these activities were calculated according to the IPCC 2006 guidelines using the Tier 1 method. (Volume 3, Chapter 3.9). The Tier 1 method calculates emissions from petrochemical processes based on activity data for the production of each petrochemical product and a process-specific emission factor for each petrochemical product (eg, methanol). Data on the production of methanol (2.B.8.a. Methanol) and ethylene (2.B.8.b. Ethylene) are taken from official statistics (Table 30.).

A default emission factor (0.67 tons of CO_2/ton of methanol produced) is used for methanol production, which assumes that methanol produced in Azerbaijan is carried out without primary production and through a conventional steam production process with natural gas as feedstock. A default factor was applied for CH_4 emissions (2.3 kg CH_4 per ton of methanol produced).

For ethylene, the Tier 1 methodology also includes a Geographic Adjustment Factor (GAF), since the standard CO_2 emission factors for ethylene production are based on data for ethylene steam crackers operating in Western Europe and therefore require an efficiency adjustment in the calculation. Adjustment coefficient for "Asia, Africa, Russia" was used for Azerbaijan. CO_2 emissions are calculated using the standard emission factor for steam cracking with naphtha as feedstock (1.73 tons of CO_2/ton of ethylene produced). CH_4 emissions are calculated using the standard emission factor for ethylene production using naphtha as feedstock (3 kg CH_4/ton ethylene).

Tier 1 estimates for this sector include emissions from combustion processes in the production of petrochemicals and emissions from other processes. Most of the combustion-related emissions in the greenhouse gas inventory in Azerbaijan are already calculated through energy statistics for the energy sector. Therefore, there is potential for double-counting of reported emissions in the IPPU sector and the Energy sector, as the consumption of natural gas and other feedstocks included in the production of methanol and ethylene is included in the Energy sector. Further research is required to understand whether the fuel used in the petrochemical industry is included in the national energy statistics for Azerbaijan. As a result of this study, calculated emissions from petrochemical processes will be subtracted from energy sector emissions to avoid double counting.

4.1.3.1.2. UNCERTAINTIES AND TIME SERIES (2.B.8. PETROCHEMICAL INDUSTRY)

Production-related emissions reported for flaring losses from previous years' emissions reports are subject to large uncertainties. In addition, over time, facilities may also make local internal changes in the routing of waste gases from various processes.

Due to limited data, the possibility of double counting of some elements of the energy sector cannot be completely excluded. Consequently, and in line with default values given by the IPCC for the uncertainty in the emission factors, an uncertainty of ±60 % is assumed. Assumptions have also been made within the calculations on the feedstock and the process utilised to produce the petrochemical, and therefore the uncertainty ranges stated in Table 3.27 of Vol. 3, Chapter 3.9 IPCC Guidelines (2006) are relevant.

Data on activities are taken from official statistics, with an assumed ±20% inaccuracies in statistical data collection.

4.1.3.1.3. CATEGORY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL (2.B.8)

Overall quality control and quality assurance was performed by appropriately engaged experts in accordance with the requirements of the IPCC 2006 guidelines and related documents.

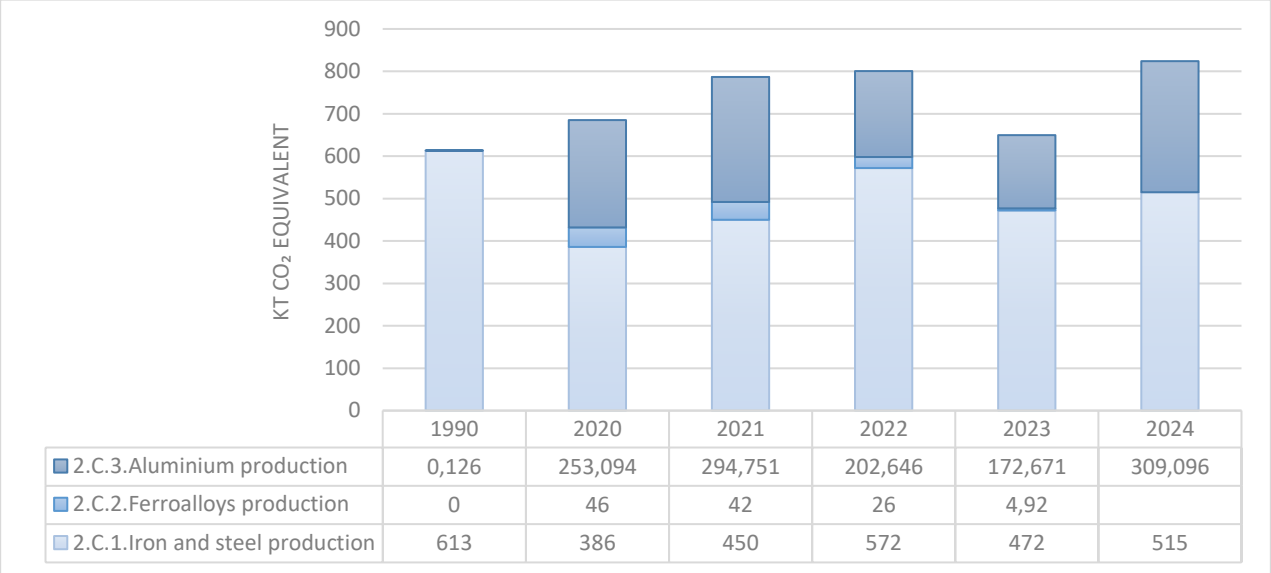
4.1.3.1.4. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.B.8)

Further investigation of the potential for double counting emissions in this category and in the energy sector is planned. The study of national statistics is also in the pipeline for improvement, as it is currently unclear whether intermediates that can be directly transformed into other chemicals or produced in integrated plants are included in national statistics. For example, production data for ethylene oxide may be incomplete because ethylene oxide may be directly converted to ethylene glycol or other products (e.g., amines and esters), so product use in activity data may underestimate their actual production levels for other petrochemical products.

4.1.4 Metal production (2.C)

In the CRT tables, category 2.C is divided into subcategories 2.C.1 to 2.C.7. In Azerbaijan, the activities currently covered by the national inventory under this category are iron and steel production (2.C.1), ferroalloy production (2.C.2) and aluminium production (2.C.3). Activity data for metal production are obtained from the State Statistical Committee (SSC).

The remaining subcategories of category 2.C are not identified as occurring in Azerbaijan in the current inventory, and no emissions are reported under these categories.



	1990	2020	2021	2022	2023	2024
2.C.3.Aluminium production	0,126	253,094	294,751	202,646	172,671	309,096
2.C.2.Ferroalloys production	0	46	42	26	4,92	
2.C.1.Iron and steel production	613	386	450	572	472	515

Figure 44. GHG emissions from metal industry

4.1.4.1. METAL PRODUCTION: IRON AND STEEL (2.C.1)

In the industrial sector, the iron and steel production category is the main source of CO_2 emissions in terms of emission levels and trends. In addition to carbon dioxide, a small amount of methane emissions also occurred in this category. During the last inventory year, there was no iron production activity in the country. This sector includes emissions from primary steelmaking furnaces and steelmaking processes. Process-related CO_2 emissions during primary steelmaking in integrated smelters are primarily due to the use of reducing agents in blast furnaces. The corresponding amount of natural gas used in steel production is included in the steel industry natural gas inputs reported in 1.A.2.a for all years.

Years	1990	2020	2021	2022	2023	2024
Steel production	420,000	264,500	308,400	391,900	323,600	352,500

Table 33. Steel production in Azerbaijan, tons

Estimated emissions from iron and steel production increased from 472.456 Gg CO_2 in 2023 to 514.650 Gg CO_2 in 2024, representing an increase of 0.042 Mt CO_2 (8.93%). This trend corresponds to the 8.9% increase in steel production, from 323,600 to 352,500 tonnes. The increase occurred alongside growth in metallurgical activity and the production of metal products in Azerbaijan. Demand from construction, infrastructure development and increased output of metal products may have contributed to this development.

4.1.4.1.1 METHODOLOGICAL ISSUES (2.C.1)

CO_2 emissions for these activities were calculated according to the IPCC 2006 guidelines using the Tier 1 method. (Volume 3, Chapter 4.2.2.1). CH_4 emissions from steelmaking processes may also be released, but these emissions are assumed to be negligible.

For emissions from iron and steel production, the Tier 1 approach applied default emission factors to national production data. The activity data used are the total steel production (tons) data provided by the SSC. The default emission factor for steel production in the Basic Oxygen Furnace (BOF) is used (1.46 tons of CO_2 per ton of steel produced).

4.1.4.1.2. UNCERTAINTIES AND CONSISTENCY OF TIME SERIES (2.C.1)

Steel production was higher in 1990 than in the recent inventory years. The observed variation in activity data is reflected consistently in the estimated emissions over the time series.

According to the calculation required, the uncertainty for the activity data here is ± 10 %. The IPCC guidelines state that the default emission factors for coke production and iron and steel production used in Tier 1 may have an uncertainty of ± 25 %.

4.1.4.1.3. CATEGORY-SPECIFIC QUALITY ASSURANCE / QUALITY CONTROL (2.C.1)

Since the general and categorical quality control and quality assurance plan is not yet ready, it was implemented by the relevant involved experts in accordance with the requirements of the applicable documents related to it. The data for the respective years appear plausible and no discrepancies were identified.

Determining emissions in categories 1.A.2.a and 2.C.1 is a complex matter, as emissions reporting and statistics differ in their underlying methods. In the interest of data quality assurance and as circumstances require, industry experts, statisticians and environmental experts conduct expert discussions to compare and evaluate data.

Given the level of aggregation of the available activity data, cross-checking between the Energy and IPPU sectors is particularly important for ensuring consistent allocation and avoiding double counting.

4.1.4.1.4. RECALCULATIONS BY CATEGORY (2.C.1)

No recalculations were made for this category of industry.

4.1.4.1.5 CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.C.1)

Since activity data are only available at the national production level, it is necessary to further disaggregate data by production type to improve emission estimates by category. This will additionally require the collection of data on the production processes and relevant material inputs, including reducing agents, limestone, direct reduced iron and sinter production, where applicable.

4.1.4.2. METAL PRODUCTION: FERROALLOY (2.C.2)

Ferroalloy is a term used to describe concentrated alloys of iron and one or more metals such as silicon, manganese, chromium, molybdenum, vanadium, and tungsten. In ferroalloy production, raw ore, carbonaceous materials, and slag-forming materials are mixed and heated to high temperatures for reduction and smelting. Ferroalloy production in Azerbaijan is a developing sector and is primarily aimed at supporting the country's metallurgical and steel industries. One of the notable projects is the Dashkasan Ferroalloy Plant, which opened in 2022 and began producing various ferroalloys, including ferrosilicon and ferromanganese, mainly for use in domestic steel production. Therefore, the importance of this category is expected to increase.

Years	1990	2020	2021	2022	2023	2024
Ferroalloys production	NO	15,368	13,915	13,270	2,464	NO

Table 34. Ferroalloys production in Azerbaijan**,** tons

The available national statistics indicate variations in ferroalloy production during 2020–2023, with production amounting to 15,368.7 tonnes in 2020, 13,915.4 tonnes in 2021, 13,270.5 tonnes in 2022 and 2,464.5 tonnes in 2023. Activity data for 2024 are reported as NO. The production statistics used in the inventory are presented in Table 34. The reported production volume declined to 2,464.5 tonnes in 2023, compared with 13,270.5 tonnes in 2022.

4.1.4.2.1. METHODOLOGICAL ISSUES (2.C.2)

Emissions for these activities were calculated using the Tier 1 method according to the IPCC 2006 guidelines. (Volume 3, Chapter 4.3.2.1)

According to the Tier 1 method, CO_2 and CH_4 emissions were calculated based on the default emission factors applied to the country's total ferroalloy production.

The activity data used was the total ferroalloy production (tons) provided by the SSC. As production data could not be disaggregated by ferroalloy type (eg ferrosilicon 45%, ferromanganese, etc.), the

average of the default emission factors for CO_2 emissions presented in Table 4.5, Chapter 4.3.2.2 of the IPCC guidelines was used to estimate emissions. The same approach was taken for CH_4 emissions using default emission factors given in the IPCC guidelines (Table 4.6, Chapter 4.3.2.2).

No production data for ferroalloys were reported in the available SSC statistics for 2024. Consequently, emissions for this year are reported as NO.

4.1.4.2.2. TIME SERIES CONSISTENCY AND UNCERTAINTIES (2.C.2)

The time series are consistent because the same methodology was used to estimate emissions in each year of the time series.

The uncertainty in emission estimates from this category is expected to be high. The IPCC 2006 guidelines are reported to have an uncertainty of 25-50 percent due to the use of Tier 1 emission factors. The midpoint in this range has been selected for the uncertainty analysis. Furthermore, activity data were not available on a disaggregated level, and therefore assumptions were made about the type of ferroalloys produced leading to uncertainty in the activity data (10%).

4.1.4.2.3. CATEGORY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL (2.C.2)

Since the general and categorical quality control and quality assurance plan is not yet ready, it has been implemented by the relevant involved experts. The data for the respective years appear plausible and no inconsistencies were identified.

4.1.4.2.4. RECALCULATIONS BY CATEGORY (2.C.2)

No recalculations were made for this category.

4.1.4.2.5. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.C.2)

Since activity data are only available at the national production level, it is necessary to collect data separately by ferroalloy type to refine emission estimates within this category.

It should also be noted that, as stated in section 4.3.2.4 of the 2006 IPCC Guidelines (vol. 3, chapter 4), when ferroalloys are produced as the primary use of carbon sources (coal, coke, limestone, dolomite, etc.), emissions are considered industrial process emissions, not combustion emissions. Therefore, there is a risk of double counting when using the first-order approach. In this regard, there is a need for planned improvements to consider the allocation of emissions between IPPU and the Energy sector.

4.1.4.3. METAL PRODUCTION: ALUMINUM (2.C.3)

"Azeraluminium" state company is the main producer of aluminum in Azerbaijan. The company operates a large production facility in Ganja, where local bauxite ore is processed into aluminum, which is then produced. The second plant in Sumgait also produces primary aluminum.

Primary aluminium production results in emissions of both CO2 and perfluorocarbons (PFCs). The main greenhouse gas emissions allocated to this category are:

I. carbon dioxide (CO2) emissions associated with the consumption of carbon anodes during the electrolytic reduction of alumina to aluminium metal; and
II. PFC emissions of CF4 (PFC-14) and C2F6 (PFC-116), which are generated during anode effects in aluminium electrolysis cells.

The primary aluminum production category is the main trending category for CF4 emissions in Azerbaijan and continues to be the largest source of PFC emissions. Thanks to extensive modernization measures and decommissioning of production facilities implemented in Azerbaijan's aluminum smelters, waste per product unit has decreased significantly.

An important improvement in the current inventory cycle is the estimation of PFC emissions from aluminium production. In BTR1, flexibility was applied with respect to the estimation of f-gases. In the current inventory, emissions of CF4 and C2F6 have been estimated and included, improving the completeness of the category.

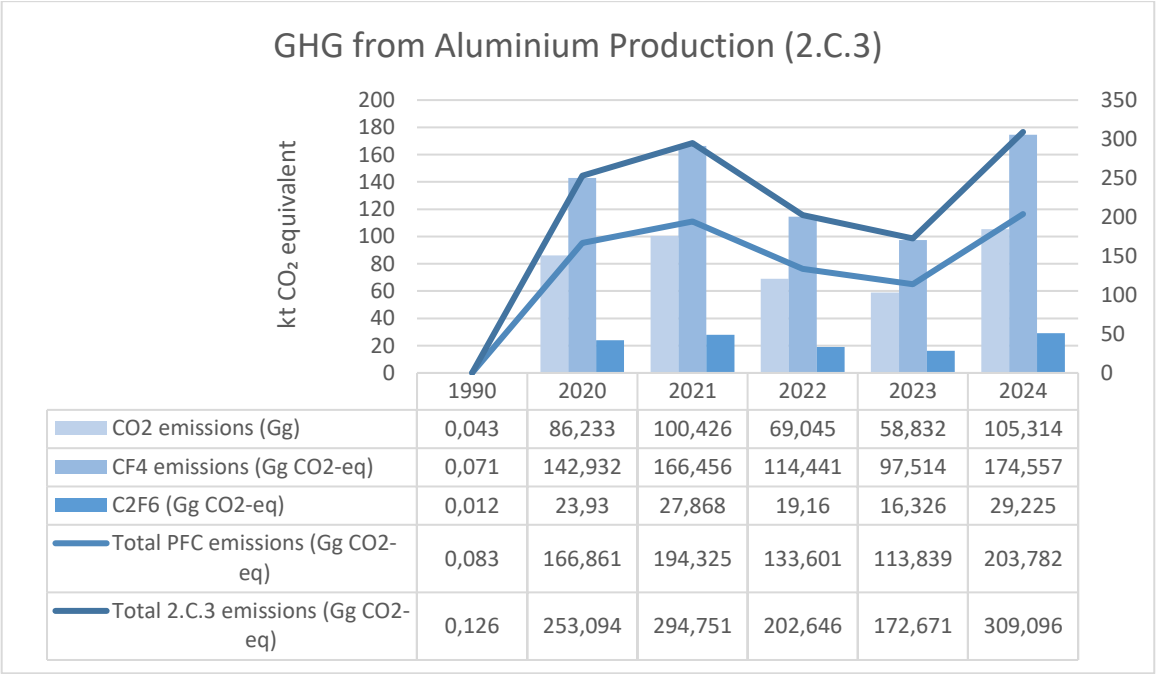
Activity data for aluminium were obtained from the State Statistical Committee (SSC). The statistical series used in the current inventory is reported as the production of aluminium products. For the purposes of the current estimates, this series has been used as a proxy for aluminium production, pending further verification of its coverage, particularly the distinction between primary

aluminium and secondary or remelted aluminium. The activity data and estimated quantities of PFCs are presented in Table 35.

Years	1990	2020	2021	2022	2023	2024
Aluminium production	26,8	53,895	62,766	43,152	36,769	65,821
CF_4 (t)	0,011	21,558	25,107	17,261	14,708	26,328
C_2F_6 (t)	0.001	2.156	2.511	1.726	1.471	2.633

Table 35. Aluminium production in Azerbaijan, tons

Primary aluminum production continues to be the largest source of PFC emissions in Azerbaijan, despite significant declines in this category as a result of declining production after 1990. Thanks to extensive modernization measures and decommissioning of production facilities in Azerbaijan's aluminum foundries, emissions per unit product have decreased significantly. However, GHG emissions from aluminum plants increased by more than 110% compared to the base year. As for the future development of PFC emissions, a low level of stagnation can be expected.



	1990	2020	2021	2022	2023	2024
CO2 emissions (Gg)	0,043	86,233	100,426	69,045	58,832	105,314
CF4 emissions (Gg CO2-eq)	0,071	142,932	166,456	114,441	97,514	174,557
C2F6 (Gg CO2-eq)	0,012	23,93	27,868	19,16	16,326	29,225
Total PFC emissions (Gg CO2-eq)	0,083	166,861	194,325	133,601	113,839	203,782
Total 2.C.3 emissions (Gg CO2-eq)	0,126	253,094	294,751	202,646	172,671	309,096

Figure 45. Activity data and greenhouse gas emissions from Aluminum Production (2.C.3)

In 2024, total estimated emissions from category 2.C.3 amounted to 309.096 Gg CO2-eq, of which PFC emissions accounted for 203.782 Gg CO2-eq, or approximately 65.9%. The inclusion of CF4 and C2F6 estimates therefore represents an important improvement in the completeness of the category. During 2020–2024, total estimated emissions from category 2.C.3 ranged from 172.671 Gg CO2-eq in 2023 to 309.096 Gg CO2-eq in 2024.

In 2024, total estimated emissions from category 2.C.3 increased by 0.136 Mt CO_2-eq (79.01%) compared with 2023. This increase reflects the rise in the activity-data series used in the current calculation, from 36,769.8 tonnes in 2023 to 65,821.0 tonnes in 2024, corresponding to an increase of approximately 79.0%.

In 2024, PFC emissions amounted to 203.782 Gg CO_2-eq, accounting for approximately 65.9% of total emissions from category 2.C.3. CO_2 emissions accounted for the remaining approximately 34.1%. The inclusion of CF_4 and C_2F_6 estimates therefore represents an important improvement in the completeness of the category.

4.1.4.3.1. METHODOLOGICAL ISSUES (2.C.3)

The relevant production activity data for aluminium production are obtained from the State Statistical Committee (SSC). Further verification is planned to confirm that the statistical series used for the inventory represents primary aluminium production only. Activity data for aluminium

products were obtained from the SSC. As the available statistical indicator is reported as aluminium products rather than explicitly as primary aluminium metal, its suitability as a proxy for primary aluminium production requires further verification. CO2 and PFC emissions were estimated using the Tier 1 methodology of the 2006 IPCC Guidelines (Volume 3, Chapter 4). The two emission components are estimated separately.

The Tier 1 method for calculating CO_2 emissions uses only broad cell technology characteristics (Prebake or Søderberg) as a lower-level estimate of CO_2 emissions from aluminium production. In Azerbaijan, Aluminium is produced by packaging technology, and therefore CO2 emissions were calculated by applying a default emission factor of 1.6 tonnes CO2 per tonne of aluminium produced to the reported activity data.

The default emission factor for Centre Worked Prebake (CWPB) is also used to estimate PFC emissions (Table 4.15 in Volume 3, Chapter 4.4.2.4 IPCC Guidelines 2006). PFC emissions were estimated separately for CF4 and C2F6 by applying default emission factors of 0.40 kg CF4/t Al and 0.04 kg C2F6/t Al, respectively. These factors correspond to the Centre Worked Prebake (CWPB) technology category in the 2006 IPCC Guidelines (Table 4.15).

PFC emissions were converted to CO2-equivalent using the AR5 100-year GWPs applied in the inventory: 6,630 for CF4 and 11,100 for C2F6.

Under the current Tier 1 approach, constant default PFC emission factors are applied to aluminium production.

4.1.4.3.2. UNCERTAINTIES AND CONSISTENCY OF TIME SERIES (2.C.3)

Time series consistency is ensured by using the same methodology and emission factors for estimating all aluminium production emissions. Due to the use of official national statistics, the uncertainty in activity data is low: around ±10%.

The IPCC guidelines state that the reactions leading to carbon dioxide emissions are well understood and the emissions are very directly connected to the tonnes of aluminium produced through the fundamental electrochemical equations for alumina reduction at a carbon anode and oxidation from thermal processes. Therefore, uncertainty in the emission factor for CO_2 is considered to be relatively low; less than ±10 %. However, the PFC emission factor used within the tier 1 emission estimation is considered to be very uncertain as there is large variability in anode effect performance among operators using similar production technology within production facilities. Uncertainty for the CWPB factors used for Azerbaijan have a stated uncertainty of -99/+380%.

In addition to the statistical uncertainty, further uncertainty relates to the coverage of the available aluminium activity-data series and its representativeness of primary aluminium production. This issue is particularly relevant where the statistical indicator may include secondary or remelted aluminium and downstream products. Clarification of the activity-data boundary would help improve the accuracy and consistency of the emission estimates.

4.1.4.3.3. CATEGORY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL (2.C.3)

Activity data used for the category are based on information from the SSC. As part of the preparation and review of the current estimates, consistency checks were undertaken between the activity data, calculation files and CRT values. The applied units, emission factors and conversion of CF4 and C2F6 emissions to CO2-equivalent were also checked for consistency.

Further QA/QC will focus on verification of the activity-data boundary, particularly confirmation that the production statistics used for category 2.C.3 represent primary aluminium production.

4.1.4.3.4. CATEGORY RECALCULATIONS (2.C.3)

In the current inventory cycle, CO_2 and PFC emissions were estimated for 1990 and 2020–2024. The explicit estimation of CF_4 and C_2F_6 emissions across the inventory time series represents an improvement compared with BTR1, in which flexibility was applied to the estimation of fluorinated gases.

Total estimated emissions from category 2.C.3 amounted to 0.126 Gg CO_2-eq in 1990, 253.094 Gg in 2020, 294.751 Gg in 2021, 202.646 Gg in 2022, 172.671 Gg in 2023 and 309.096 Gg in 2024.

4.1.4.3.5. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.C.3)

An investigation is required to determine whether any secondary aluminum production data are available in the national aluminum production statistics within the country, as this production quantity will not be relevant to the emissions calculation as mentioned above and may lead to some overestimation of emissions from this category. A verification that the national activity-data series used for the inventory represents primary aluminium production and excludes secondary/remelted aluminium.

4.1.5. Use of non-energy related products from fuels and solvents (2.D)

4.1.5.1 LUBRICANT USE (2.D.1)

Lubricants are used to reduce friction and wear of machine parts. They can also be used for energy and heat transfer. In addition, lubricants are also used as sealants and they are used to prevent deposit build-up and corrosion protection. Technical oils, which are considered lubricants, are used both as raw materials and as auxiliary and working materials.

The use of lubricating oils can be divided into two main areas: (a) use in automobiles and other mobile sources; and (b) industrial and other applications. For inventory purposes, category 2.D.1 covers CO_2 emissions arising from the non-energy use of lubricants during their first use.

The activity data used for the emission estimates represent total lubricant consumption expressed in energy units (TJ), as required by the IPCC methodology. The latest activity data and corresponding emission estimates are presented below.

Years	1990	2020	2021	2022	2023	2024
Lubricants production	1,897.44	1,463.28	2,343.66	1,804.98	2408	2838

Table 364. Lubricant consumption in Azerbaijan, TJ

Many different types of losses can occur during product use. Possible types of loss include:
- evaporation
- (co-) combustion
- leakage
- export (especially for car lubricants)
- transformations into products
- adhesion to products

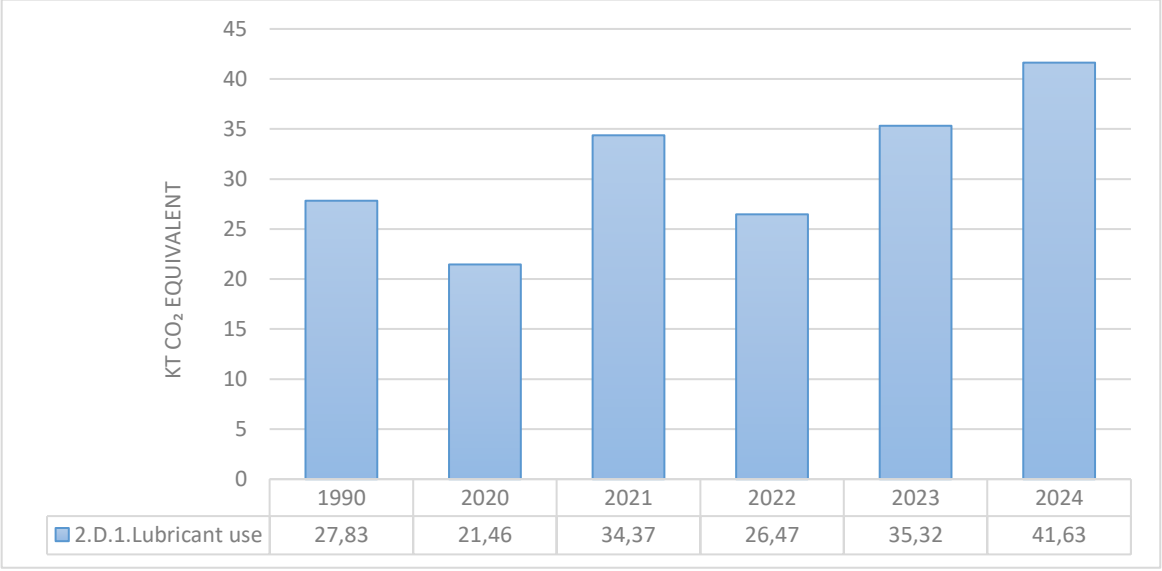


Figure 45. GHG emissions from Lubricant use

In 2024, emissions increased by 6.308 Gg CO_2 (approximately 17.9%) compared with 2023, corresponding to an increase in lubricant consumption from 2,408.00 to 2,838.12 TJ.

4.1.5.1.1. METHODOLOGICAL ISSUES (2.D.1)

The emissions assessment for this category was carried out in accordance with the Tier 1 methodology as outlined in the IPCC 2006 Guidelines. This method applies emission factors to activity data on the amount of lubricant consumption in a country (in energy units, such as TJ). During the calculation, the standard carbon content and standard ODU (ISO- Oxidized in Use) of lubricating oils and a coefficient of 0.2 were used (Table 5.2, Chapter 5, Volume 3, IPCC Guidelines 2006).

Activity information was provided by the SSC.

4.1.5.1.2. UNCERTAINTIES AND CONSISTENCY OF TIME SERIES (2.D.1)

Uncertainties for specific emission factors for species groups for the stationary lubricant use area are derived from emission factor ranges. The IPCC guidelines state that the standard ODU factors developed are too uncertain because they are based on limited knowledge of typical lubricant oxidation rates. Expert opinion suggests using an uncertainty of 50 percent. In addition, the carbon content coefficients are based on two studies of the carbon content and calorific value of lubricating oils, from which an uncertainty range of approximately ±3 percent is estimated (US EPA, 2004).

Uncertainties for activity data are assumed to be 5%, consistent with the expected uncertainty associated with the use of national datasets. The level of consumption of lubricant oil in Azerbaijan is relatively stable, and consistency of time series is achieved using the same methodology for all time series.

Lubricant consumption varied across the inventory time series. In particular, consumption increased in 2024 compared with 2023, resulting in a corresponding increase in estimated emissions. Time-series consistency is maintained through the application of the same methodology, default parameters and calculation approach across all inventory years.

4.1.5.1.3 CATEGORY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL (2.D.1)

Overall quality control and quality assurance was performed in accordance with the IPCC 2006 guidelines and the requirements of relevant documents.

When using the standard emission factor given in the 2006 IPCC Guidelines, it is not possible to distinguish between the uses from which CO_2 emissions are generated.

In this regard, if the Tier 1 method is used, CO_2 emissions from the industrial use of lubricants can be doubled.

For mobile use, the same works were carried out in accordance with the requirements of the general instruction on quality control and quality assurance and relevant documents by the relevant experts.

4.1.5.1.4. RECALCULATIONS BY CATEGORY (2.D.1)

No recalculation was made for this category.

4.1.5.1.5. CATEGORY-SPECIFIC PLANNED IMPROVEMENTS (2.D.1)

No improvements are planned for this category. Nevertheless, consistency checks of lubricant consumption data against available production, import and export statistics will continue as part of the general inventory QA/QC procedures. Further attention will also be given to the distinction between non-energy lubricant use and lubricant consumption for energy purposes to ensure appropriate sectoral allocation and avoid double counting.

4.1.6 Product Uses as Substitutes for ODS (2.F)

Category 2.F covers emissions of fluorinated greenhouse gases used as substitutes for ozone-depleting substances (ODS). In accordance with the 2006 IPCC Guidelines, the category comprises refrigeration and air conditioning (2.F.1), foam blowing agents (2.F.2), fire protection (2.F.3), aerosols (2.F.4), solvents (2.F.5), and other applications (2.F.6).

4.1.6.1 CATEGORY OVERVIEW AND NATIONAL CIRCUMSTANCES

In Azerbaijan, the use of fluorinated substitutes has developed in the context of the country's implementation of the Montreal Protocol and the progressive phase-out of controlled ozone-depleting substances. Azerbaijan ratified the Kigali Amendment to the Montreal Protocol on 24 November 2025, and the Amendment entered into force for Azerbaijan on 22 February 2026. The implementation of the Kigali Amendment has increased the importance of systematic collection and verification of national information on HFCs and has complemented efforts to strengthen the activity-data basis for the national GHG inventory.

The national supply of fluorinated substitutes is predominantly import-dependent. Domestic production in the years preceding 2025 was limited compared with imported quantities, while no domestic production has been recorded since 2025. Fluorinated gases enter the national market both as bulk substances and as gases contained in imported equipment and products. Customs information therefore represents an important source of activity data for Category 2.F, complemented, where available, by information on equipment and products containing fluorinated gases.

In BTR1, emissions from refrigeration and air conditioning (2.F.1) were not estimated because the available national activity data were not sufficiently disaggregated to support emission estimation within a reasonable level of uncertainty. Azerbaijan applied the flexibility provided under paragraph 48 of the modalities, procedures and guidelines with respect to the reporting of additional gases. Improvement of the activity-data basis and development of F-gas emission estimates were identified as planned improvements for BTR2.

For BTR2, the activity-data basis has been substantially strengthened through the compilation of Customs information on individual HFCs and commercial refrigerant blends covering the period 2011–2024. This represents an important improvement compared with BTR1 and provides a more robust basis for the assessment of emissions from Category 2.F in accordance with the applicable IPCC methodologies.

Customs trade data do not, by themselves, represent emissions to the atmosphere or necessarily establish the end-use application of the substances concerned. Depending on the application, fluorinated gases may remain contained in equipment or products and form part of the installed bank, with emissions occurring at different stages of the equipment or product life cycle. Accordingly, trade information is treated as activity data within the applicable IPCC methodological framework rather than being reported directly as annual emissions.

Information on HFC production, imports and exports is also relevant to Azerbaijan's implementation of the Montreal Protocol and its Kigali Amendment. However, HFC consumption under the Montreal Protocol and HFC emissions reported under the UNFCCC national GHG inventory represent distinct accounting concepts and are not directly interchangeable.

4.1.6.2 METHODOLOGICAL APPROACH

Emissions from Category 2.F were estimated in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3, Chapter 7, taking into account the applicable updates and supplementary guidance provided in the 2019 Refinement. The methodological approach was selected taking into consideration the availability and level of disaggregation of national activity data.

For BTR2, the principal activity-data source was Customs information on fluorinated gases imported in bulk, including individual HFCs and commercial refrigerant blends. The available historical dataset covers the period 2011–2024 and represents a substantial improvement in the activity-data basis compared with BTR1. Where relevant and available, information on exports of bulk fluorinated gases was also taken into account. The underlying data sources and their treatment are described in Section 4.1.6.3.

The Customs data identify fluorinated gases imported in bulk but do not systematically specify their final application. Consequently, substances were allocated to individual 2.F applications based on the type of fluorinated gas or refrigerant blend and its predominant use. This approach was applied to address the current limitations in application-specific national activity data and is reflected in the uncertainty assessment.

Based on this allocation, the majority of the identified fluorinated gases and refrigerant blends were assigned to refrigeration and stationary air conditioning (2.F.1.a), consistent with their predominant use as refrigerants. Where the characteristics of the substance and available information supported other end uses, relevant quantities were allocated to foam blowing agents (2.F.2) and fire protection (2.F.3). The allocation of individual gases and blends and the basis for their classification are described in Section 4.1.6.3.

Quantities of fluorinated gases supplied in bulk were used as activity data and were not treated as equivalent to emissions in the year of import. Emissions were estimated using the applicable IPCC methodological approach and parameters for the respective applications.

The available historical Customs dataset covers fluorinated gases imported in bulk and does not provide the information required to quantify fluorinated gases contained in imported equipment and products over the inventory period. In particular, a consistent historical dataset on equipment type, number of units, refrigerant type and refrigerant charge was not available to support a sufficiently reliable estimate. Emissions associated with fluorinated gases contained in imported equipment and products are therefore reported as NE (Not Estimated) in the current inventory. The use of NE reflects an identified activity-data limitation and does not imply that the activity or associated emissions are absent.

No assumption of zero emissions was applied to this source, and no retrospective estimates were introduced on the basis of unverified equipment characteristics or unsupported extrapolation. Development of the activity-data framework required for estimation of fluorinated gases contained in imported equipment and products has been identified as an inventory improvement and is further addressed in Section 4.1.6.11.

4.1.6.3 ACTIVITY DATA AND DATA SOURCES

4.1.6.3.1 CUSTOMS DATA ON BULK FLUORINATED GASES

The principal source of activity data for Category 2.F was information provided by the State Customs Committee on fluorinated gases supplied in bulk. The compiled dataset covers the period 2011–2024 and includes individual HFCs and commercial refrigerant blends. Information on exports was also taken into account where available.

The individual substances identified in the Customs data include HFC-23, HFC-32, HFC-41, HFC-125, HFC-134, HFC-134a, HFC-143a, HFC-152a, HFC-227ea, HFC-236fa and HFC-365mfc. The dataset also includes the commercial refrigerant blends R-404A, R-407A, R-407C, R-410A, R-507A and R-508B.

The Customs data were compiled by year and substance or blend and processed to derive the activity data used for inventory estimation. Records identified as HFC-134 and HFC-134a were maintained separately and were not combined without verification of their chemical identity. Detailed declaration-level information was retained in the inventory working files, while the activity data are presented below in aggregated form.

Year	Substance/blend	Quantity (t)	Trade information
2011	HFC-134a	15.362	Import
	HFC-143a	13.300	Import
	R-407C	1.500	Import
	R-404A	4.093	Import
2012	HFC-134a	14.000	Import
	R-404A	0.030	Import
2013	HFC-134	0.831	Import
	HFC-134a	2.555	Import
	HFC-134a	0.571	Export
	R-407C	0.300	Import
	R-404A	2.221	Import
2014	HFC-134a	40.758	Import
	R-410A	23.834	Import
	R-407C	2.000	Import
	R-404A	34.691	Import
2015	HFC-134a	13.187	Import
	R-507A	1.500	Import
	R-410A	29.584	Import
	R-407C	9.402	Import
	R-407C	0.704	Export
	R-404A	20.046	Import
2016	HFC-134	17.668	Import
	HFC-134a	297.041	Import
	HFC-227ea	5.049	Import
	HFC-152a	0.013	Import
	R-507A	0.148	Import
	R-508B	0.101	Import
	R-410A	30.839	Import
	R-407C	10.762	Import
	R-407A	1.052	Import
	R-404A	63.460	Import
2017	HFC-134	51.536	Import
	HFC-134a	176.982	Import
	HFC-227ea	0.194	Import
	R-410A	7.407	Import
	R-407C	5.174	Import
	R-404A	0.233	Import
2018	HFC-134a	222.749	Import
	HFC-227ea	0.315	Import
	HFC-23	0.330	Import
	R-507A	1.266	Import
	R-410A	78.353	Import
	R-407C	15.246	Import
	R-404A	84.889	Import
2019	HFC-32	0.070	Import
	HFC-134	6.134	Import
	HFC-134a	175.391	Import
	HFC-227ea	3.242	Import
	R-507A	8.255	Import
	R-410A	53.597	Import
	R-407C	40.248	Import
	R-407A	2.280	Import
	R-404A	87.717	Import

	HFC-365mfc	0.050	Import
2020	HFC-125	1.740	Import
	HFC-32	0.100	Import
	HFC-134a	203.133	Import
	HFC-227ea	9.164	Import
	R-507A	1.469	Import
	R-410A	106.088	Import
	R-407C	67.244	Import
	R-407A	1.695	Import
	R-404A	142.205	Import
2021	HFC-32	3.000	Import
	HFC-134a	146.753	Import
	HFC-227ea	0.148	Import
	HFC-23	0.077	Import
	HFC-236fa	0.460	Import
	R-507A	15.594	Import
	R-508B	0.004	Import
	R-410A	65.035	Import
	R-407C	39.839	Import
	R-404A	84.781	Import
2022	HFC-32	0.625	Import
	HFC-134	0.030	Import
	HFC-134a	197.070	Import
	HFC-227ea	3.587	Import
	R-508B	0.009	Import
	R-410A	10.217	Import
	R-407C	33.053	Import
	R-407A	3.413	Import
	R-404A	34.188	Import
2023	HFC-32	3.550	Import
	HFC-134	3.521	Import
	HFC-134a	219.294	Import
	HFC-227ea	2.373	Import
	HFC-23	0.008	Import
	HFC-152a	0.002	Import
	R-507A	2.712	Import
	R-410A	0.109	Import
	R-407C	71.712	Import
	R-404A	0.796	Import
2024	HFC-32	3.912	Import
	HFC-134	0.272	Import
	HFC-134a	194.335	Import
	HFC-143a	0.110	Import
	HFC-227ea	12.126	Import
	R-507A	5.424	Import
	R-410A	17.963	Import
	R-407C	44.821	Import
	R-407A	4.241	Import
	R-404A	11.626	Import
	HFC-41	1.544	Import

Table 37. Bulk fluorinated gases and commercial refrigerant blends recorded in the Customs dataset, 2011–2024 (tonnes)

4.1.6.3.2 APPLICATION ALLOCATION AND TREATMENT OF COMMERCIAL BLENDS

As described in Section 4.1.6.2, the Customs data do not systematically identify the final application of bulk fluorinated gases. For inventory compilation, the substances and blends were therefore allocated to the relevant 2.F applications based on their predominant technical use.

Most of the fluorinated gases identified in the Customs dataset, including all commercial refrigerant blends, were allocated to refrigeration and stationary air conditioning (2.F.1.a).

4.1.6.3.3 FLUORINATED GASES CONTAINED IN IMPORTED EQUIPMENT AND PRODUCTS

A consistent historical dataset containing the information required to quantify fluorinated gases contained in imported equipment and products was not available for the inventory period. In particular, information on equipment type, number of units, refrigerant type and refrigerant charge was not available on a sufficiently consistent basis to establish a reliable historical activity-data series.

Accordingly, fluorinated gases contained in imported equipment and products were not included in the quantitative estimates for the current inventory and the associated emissions are reported as NE (Not Estimated). The use of NE reflects the identified activity-data limitation and does not imply that imports of such equipment or the associated emissions did not occur.

Equipment-level Customs information became available for 2025 through cooperation with experts involved in implementation of the Kigali Amendment. However, comparable information was not available for the preceding years and the 2025 dataset was not used to retrospectively extrapolate equipment-related activity data for the inventory period. Development of a systematic activity-data framework for fluorinated gases contained in imported equipment and products is addressed under the planned improvements in Section 4.1.6.11.

4.1.6.4 REFRIGERATION AND AIR CONDITIONING (2.F.1)

Refrigeration and air conditioning represents the principal application of fluorinated gases identified in the available national activity data. Emissions were estimated for fluorinated gases allocated to refrigeration and stationary air conditioning (2.F.1.a), using the activity data described in Section 4.1.6.3 and in accordance with the 2006 IPCC Guidelines and the applicable guidance of the 2019 Refinement.

The available Customs data do not systematically identify the final use of bulk refrigerants among the individual refrigeration and air-conditioning sub-applications. The estimate was therefore developed at the aggregated application level, without introducing unsupported assumptions to distribute the available quantities among domestic, commercial, industrial and transport refrigeration or stationary air-conditioning applications.

Given the level of disaggregation of the available activity data, emissions were estimated at the overall RAC application level using the Tier 1 approach of the IPCC Guidelines. Consistent with the IPCC methodology for applications in which fluorinated gases accumulate in equipment, annual quantities of refrigerants supplied to the market were not treated as equivalent to emissions in the year of supply. The estimation accounts for the development of the refrigerant bank and associated emissions over time.

Commercial refrigerant blends allocated to 2.F.1.a were decomposed into their constituent fluorinated greenhouse gases as described in Section 4.1.6.3.2, and emissions were estimated and reported by individual gas.

Fluorinated gases contained in imported equipment and products were not included in the quantitative estimate due to the activity-data limitations described in Section 4.1.6.3.3 and are reported as NE.

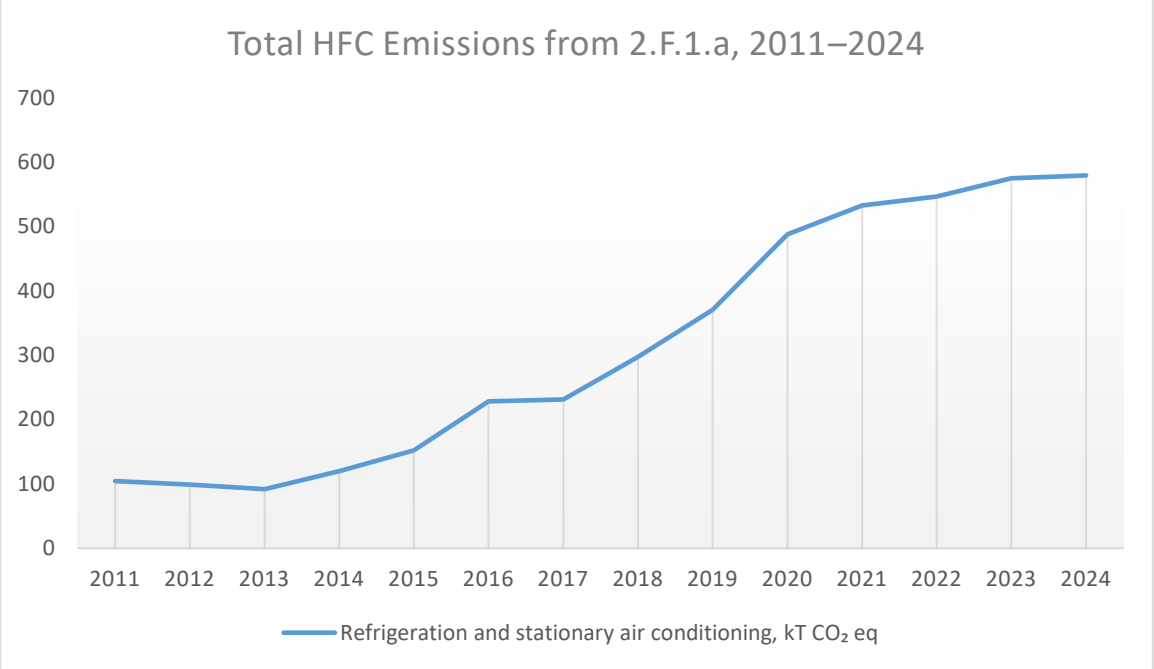


Figure 34. Total HFC Emissions from Bulk Fluorinated Gases under Refrigeration and Stationary Air Conditioning (2.F.1.a), 2011–2024

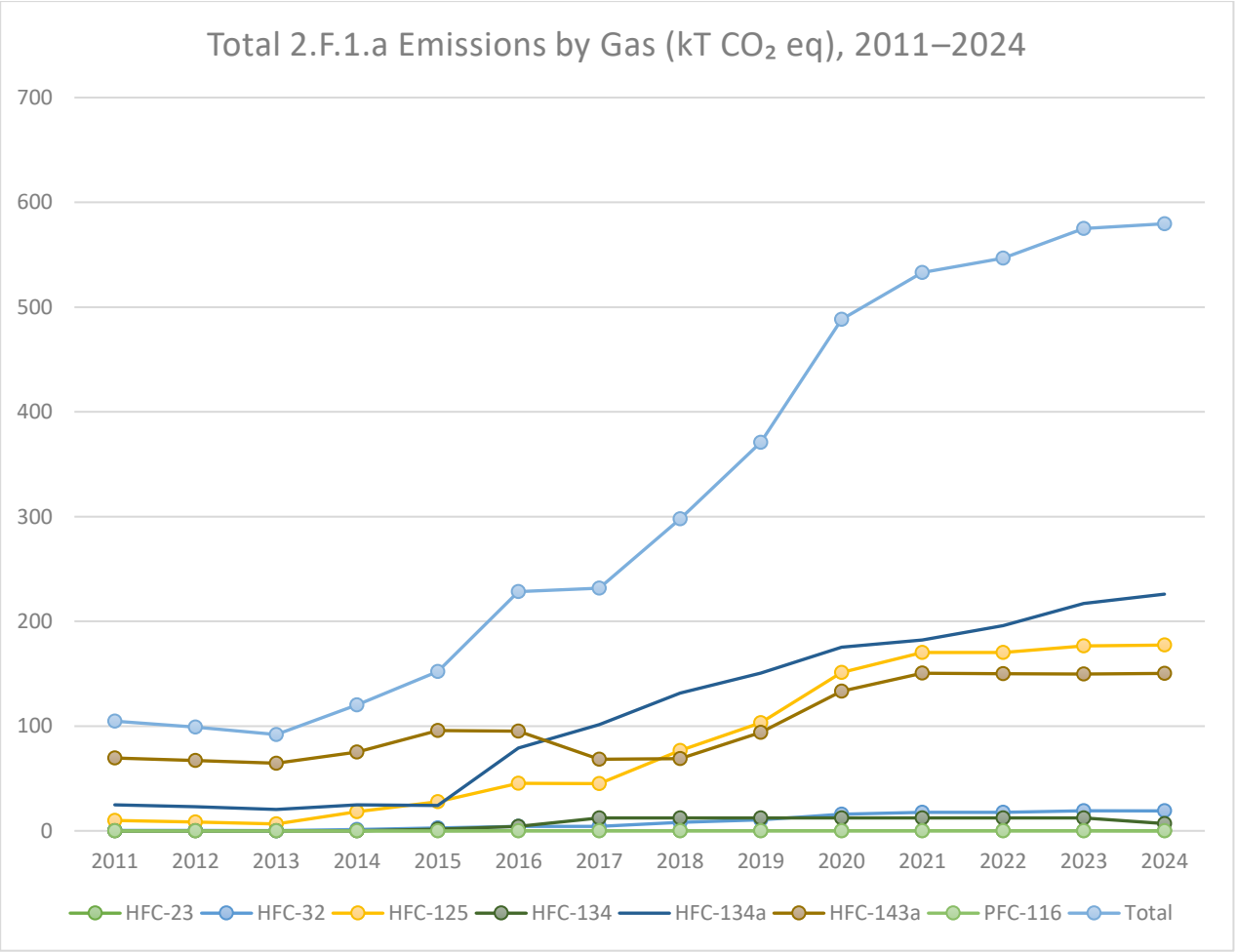


Figure 45. Emissions estimated from bulk fluorinated gases under refrigeration and stationary air conditioning (2.F.1.a), by gas, 2011–2024 (Gg CO_2-eq)

Emissions from refrigeration and stationary air conditioning are presented in Table 34 and Figure 45. Total emissions increased from 104.6 Gg CO_2-eq in 2011 to 579.6 Gg CO_2-eq in 2024. The increase over the period was mainly associated with the growing contributions of HFC-134a and HFC-125, while HFC-143a also remained a significant contributor.

4.1.6.5 OTHER APPLICATIONS

In addition to refrigeration and air conditioning, the available activity data were assessed for foam blowing agents (2.F.2) and fire protection (2.F.3). The general activity-data sources and application-allocation approach are described in Section 4.1.6.3.

4.1.6.5.1 FOAM BLOWING AGENTS (2.F.2)

HFC-365mfc was allocated to foam blowing agents (2.F.2) based on its predominant technical use. The available Customs dataset records 0.050 tonnes of HFC-365mfc imported in 2019, with no identified quantities in the other years of the 2011–2024 period.

Under the 2006 IPCC Guidelines, the emission profile of foam blowing agents depends on the type of foam application. In particular, closed-cell foams retain part of the blowing agent in the product and form a bank from which emissions occur over time, whereas emissions from open-cell applications occur predominantly during or shortly after manufacture. The available national data identify the quantity of HFC-365mfc supplied in bulk but do not identify the specific foam application or provide sufficient information to determine the applicable emission profile.

Consequently, applying either a prompt-emission or banked approach would require assumptions that are not supported by the available national activity data. Emissions from foam blowing agents are therefore reported as NE (Not Estimated). Development of the application-specific activity data required for estimation is included among the planned improvements described in Section 4.1.6.11.

4.1.6.5.2 FIRE PROTECTION (2.F.3)

HFC-227ea was allocated to fire protection (2.F.3) based on its predominant technical use. The available Customs dataset records bulk imports of HFC-227ea from 2016 onwards, while no exports were identified.

Emissions were estimated using the Tier 1 methodology for fire protection provided in the 2006 IPCC Guidelines, Volume 3, Chapter 7. Fire protection is treated as a banked application; accordingly, annual quantities of HFC-227ea supplied to the market were not treated as equivalent to emissions in the year of supply. The estimation takes into account the development of the HFC-227ea bank over time using the applicable IPCC default parameters.

Year	HFC-227ea (t)	Gg CO_2-eq
2016	0,202	0,677
2017	0,202	0,677
2018	0,207	0,693
2010	0,328	1,099
2020	0,683	2,288
2021	0,683	2,288
2022	0,800	2,679
2023	0,864	2,893
2024	1,314	4,403

Table 35. HFC-227ea emissions from fire protection (2.F.3), 2016–2024

Estimated HFC-227ea emissions increased from 0.202 tonnes (0.677 Gg CO_2-eq) in 2016 to 1.314 tonnes (4.403 Gg CO_2-eq) in 2024.

4.1.6.5.3 AEROSOLS (2.F.4)

No fluorinated gases in the available bulk Customs dataset were specifically allocated to aerosol applications. The absence of identified bulk activity data does not establish that HFC-containing aerosol products were not used or imported during the inventory period. As sufficient application-specific activity data are not available, emissions from aerosols are reported as NE (Not Estimated).

4.1.6.5.4 SOLVENTS (2.F.5)

No fluorinated gases in the available bulk Customs dataset were specifically allocated to solvent applications, and sufficient application-specific activity data are not available to support an emission estimate. Emissions from solvents are therefore reported as NE (Not Estimated).

4.1.6.5.5 OTHER APPLICATIONS (2.F.6)

No specific activity data suitable for estimation were identified for other applications under Category 2.F.6. As the available information is insufficient to establish the absence of all potentially relevant activities, emissions are reported as NE (Not Estimated).

4.1.6.6 CONSISTENCY WITH MONTREAL PROTOCOL/ODS INFORMATION

The development of activity data for Category 2.F was undertaken in close coordination with the national arrangements for implementation of the Montreal Protocol and its Kigali Amendment, including cooperation with the responsible national focal point and the State Customs Committee. This cooperation supported the identification and compilation of information on individual HFCs and commercial refrigerant blends used in the inventory.

A clear distinction is maintained between information reported under the Montreal Protocol and emission estimates prepared under the UNFCCC. Montreal Protocol information on HFC production, imports, exports and consumption relates to the supply and control of the substances concerned, whereas the national GHG inventory estimates releases of these gases to the atmosphere in accordance with the applicable IPCC methodologies. Consequently, Montreal Protocol consumption and annual bulk imports are not treated as equivalent to annual HFC emissions. For banked applications, such as refrigeration and air conditioning and fire protection, part of the fluorinated gases supplied remains contained in equipment and products, with emissions occurring over time.

Information generated through implementation of the Montreal Protocol and its Kigali Amendment provides a complementary basis for assessing the completeness and consistency of the activity data used for Category 2.F and can support the identification of data gaps and inventory QA/QC. Continued coordination among the responsible national institutions is expected to further strengthen the historical activity-data series and the information available on fluorinated gases contained in imported equipment and products. Related improvements are described in Section 4.1.6.11.

4.1.6.7 TIME-SERIES CONSISTENCY AND RECALCULATIONS

In BTR1, emissions from refrigeration and air conditioning (2.F.1) were not estimated due to limitations in the availability and disaggregation of national activity data. Azerbaijan applied the flexibility provided under paragraph 48 of the MPGs with respect to the reporting of additional gases, while improvement of the activity-data basis for F-gases was identified as a planned improvement.

For BTR2, the compilation of historical Customs data on fluorinated gases imported in bulk, including individual HFCs and commercial refrigerant blends, enabled the development of quantitative estimates for relevant Category 2.F sources for the period 2011–2024. As no numerical estimates were previously reported for these sources, their quantification in BTR2 represents an improvement in inventory completeness rather than a recalculation of previously reported emission estimates.

The available activity data on fluorinated gases imported in bulk for 2011–2024 were processed consistently across the time series, including the treatment of individual substances, commercial refrigerant blends and their allocation to the relevant applications. The beginning of the available Customs data series does not necessarily represent the beginning of national use or of existing fluorinated-gas banks. Remaining limitations affecting historical coverage and fluorinated gases contained in imported equipment and products are addressed in Sections 4.1.6.3.3 and 4.1.6.10.

4.1.6.8 UNCERTAINTY ASSESSMENT

Azerbaijan applies the flexibility provided under paragraph 29 of the MPGs with respect to uncertainty assessment. As the quantitative input data required to estimate uncertainty are not available for Category 2.F, uncertainty was assessed qualitatively in accordance with the IPCC Guidelines.

The principal sources of uncertainty in the estimated emissions relate to the level of disaggregation of the available activity data and the use of methodological assumptions and default parameters. Customs data on fluorinated gases imported in bulk do not systematically identify their final application. Consequently, allocation of individual substances and commercial refrigerant blends to the relevant 2.F applications introduces uncertainty in the distribution of activity among subcategories. For refrigeration and stationary air conditioning (2.F.1), additional uncertainty arises from estimation at an aggregated application level and the parameters used to characterize emissions over time. For fire protection (2.F.3), uncertainty is associated with the historical development of the HFC-227ea bank and the limited information available for periods preceding the Customs data series.

A distinction is made between uncertainty in estimated emissions and incompleteness associated with sources reported as NE. Emissions associated with fluorinated gases contained in imported equipment and products, as well as those 2.F applications for which sufficient application-specific activity data are not available, could not be quantitatively assessed. Their potential contribution therefore represents a completeness limitation of unknown magnitude rather than a quantified uncertainty in the reported estimates. These limitations and associated data needs inform the planned improvements described in Section 4.1.6.10.

4.1.6.9 QA/QC

Category 2.F was subject to the general national inventory QA/QC procedures described in Section 1.5. Category-specific QC focused on the activity data on fluorinated gases imported in bulk, which were obtained from the State Customs Committee through a formal data request. The requested information was compiled by the responsible Customs personnel from relevant records and departments and provided for inventory preparation. During compilation, the activity data were checked for substance identification, units and conversions, treatment of individual HFCs and commercial refrigerant blends, and consistency of data processing across the time series. Particular attention was given to maintaining separately identified substances, including HFC-134 and HFC-134a, and to the treatment of commercial blends in the calculation of gas-specific emissions.

Coordination with the national focal point responsible for implementation of the Montreal Protocol and its Kigali Amendment also supported access to information relevant to Category 2.F, including Customs information on equipment containing fluorinated gases for 2025. This information requires further detailed review, classification and processing before it can be used for inventory estimation and was therefore not incorporated into the current quantitative estimates.

Further work will focus on the review and processing of equipment-level information, including identification of equipment and refrigerant types and determination of refrigerant charge where the necessary information is available. The associated data and QA/QC improvements are addressed in Section 4.1.6.10.

4.1.6.10 PLANNED AND NEEDED IMPROVEMENTS

BTR1 identified the development of activity data for fluorinated gases as a priority improvement for BTR2. Significant progress has subsequently been made through the compilation of historical Customs data on individual HFCs and refrigerant blends. However, important data gaps remain, particularly for equipment containing fluorinated gases and for the information required to characterize equipment stocks and associated F-gas banks.

Further improvement of Category 2.F requires systematic collection and processing of equipment- and application-specific information, including equipment type and population, refrigerant type and charge, servicing practices, equipment lifetime and retirement, and recovery and disposal practices. Historical information is also required to reconstruct the development of F-gas banks and establish a consistent emission time series. These data are not available through a single, standardized national data system suitable for inventory compilation.

Addressing these gaps requires dedicated technical work extending beyond routine inventory preparation, including historical data reconstruction, processing and classification of large equipment-level datasets, development of application-specific parameters, establishment of regular institutional data flows, and strengthening of national capacity for F-gas bank modelling, emission estimation and QA/QC.

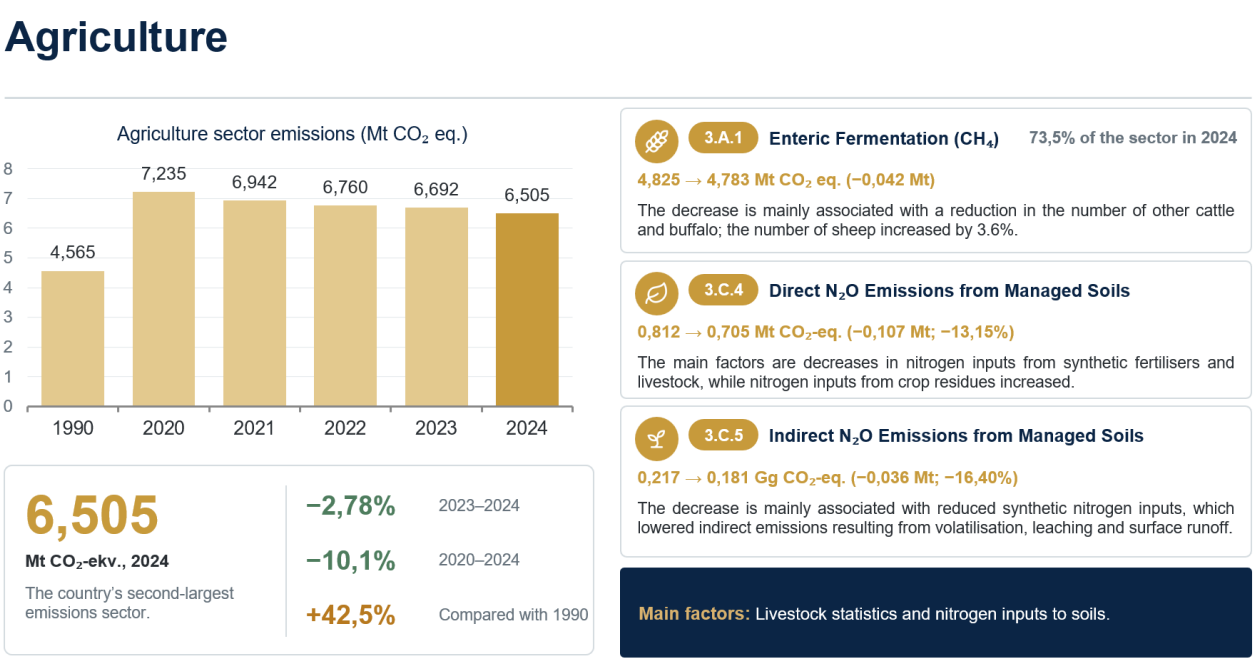
Dedicated technical and capacity-building support would therefore facilitate the establishment of a sustainable national F-gas inventory system and enable progressive transition towards more detailed equipment- and application-based estimation in accordance with the IPCC Guidelines. Such support would improve the completeness, accuracy and time-series consistency of Category 2.F and strengthen Azerbaijan's capacity to meet the increasing data and reporting requirements associated with both the Enhanced Transparency Framework and implementation of the Kigali Amendment.

5. Agriculture (CRT sector 3)

The Republic of Azerbaijan was known as an agricultural country until the end of XX century. Since its agricultural field had great opportunities, it was a producer of a wide range of agricultural goods. The development of grain-growing, cotton-growing, viticulture, vegetable and fruit-growing industries in the fertile lands of the country was gaining momentum. The livestock area was also expanding. An increase in the number of cattle, sheep and goats led to an increase in dairy products. In the 1970-80s, the agricultural sector formed 25% of the country's GDP. Currently, this figure is about 5%.

In the 1990s, the country's transition from a planned form of economy to a market economy led to a decline in the agricultural sector, as well as in all economic sectors. Return of land to the population, creation of fertile conditions for the development of an agricultural economy gave impetus to the development of this sector. In state programs and plans, attention is regularly paid to the agricultural sector. Thus, the “Strategy for socio-economic development of the Republic of Azerbaijan in 2022–2026“ document adopted in the country includes the direction of activity called “Development of sustainable and competitive agriculture and agribusiness.

Recent inventory estimates indicate that agricultural emissions have generally declined since 2020, reflecting changes in livestock populations and nitrogen inputs to agricultural soils.



5.1. Category description (1990, 2020-2024)

In the agricultural sector of Azerbaijan, there is information about emissions from enteric fermentation (3.A), manure management (3.B), agricultural land use (3.D) and rice cultivation (3.C). Due to the lack of statistical data on the use of lime (3.G), information on these emissions is not included in the report and is marked as “NE’ using notation keys. In Azerbaijan, the burning of agricultural residues in field (3.E) is prohibited by law and land clearing through burning is not practiced (“NO”). There are no activities related to burning of savannahs (3.F) in the country. Although there is significant potential for methane capture from both livestock and agricultural residues in the country’s agricultural sector, official statistics do not provide data on these activities.

Azerbaijan applies tier 1 methodology for all agriculture categories. As no disaggregated information is available for all agriculture categories country is unable to estimate at higher tier. Azerbaijan will put forward an improvement plan which will include an action plan with timelines and collection of the necessary data.

Between 1990 and 2024, total emissions from agriculture increased from 4,564.7 kt CO_2eq to 6,505.4kt CO_2 eq, representing an increase of 42.5%. Following the peak of 7,234.6 kt CO_2-eq in

2020, emissions declined to 6,942.1 kt in 2021, 6,760.0 kt in 2022, 6,691.7 kt in 2023 and 6,505.4 kt in 2024. The 2024 level was 2.8% lower than in 2023.

The largest contributor, enteric fermentation, saw a substantial rise from 3,377 kt CO_2 eq in 1990 to 4,782.6 kt CO_2eq in 2024, as a result of significant growth in the cattle population. Emissions from manure management (CH_4 and N_2O) also increased for this reason. Emissions from rice production grew from 7.7 kt CO_2 eq. to 21.3kt CO_2 eq. due to the expansion of rice cultivation areas. Emissions from agricultural soils nearly doubled, rising from 575.8 kt CO_2 eq in 1990 to 863kt CO_2 eq in 2024, driven by several factors: an increase in livestock population, leading to more manure applied to agricultural soils and more manure dropped by animals during grazing. However, this growth was somewhat offset by a reduction in the use of synthetic fertilizers on agricultural soils.

CRT code	Category	1990		2020	2021	2022	2023	2024	
		kt CO_2 eq.	%	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	%
3.A.	Enteric fermentation	3,377.037	73.98	5,177.38	5,163.6	5,102.7	**4,824.64**	**4,782.6**	73.52
3.B.	Manure management (CH_4)	326.895	7.16	530.03	532.68	531.6	**507.67**	**503.22**	7.74
3.B.	Manure management (direct and indirect N_2O)	254.412	5.57	337.54	336.04	331.42	**317.28**	**312.02**	4.80
3.C.	Rice cultivation	7.666	0.17	12.8	13.14	13.33	**13,5**	**21.31**	0.33
3.D.	Agricultural soils	598.715	13.12	1,176.72	896.6	780.97	**1,028.57**	**886.16**	13.62
3.F.	Prescribed burning of savannahs and Field burning of agricultural residues	NE	-	NO	NO	NO	**NO**	**NO**	-
3.G.	Liming	NE	-	NE	NE	NE	**NE**	**NE**	-
3.H.	Urea application	NE	-	0,16	0,07	0,015	**0,047**	**0.072**	0,001
3.	**Total agriculture**	**4,565.724**	**100**	**7,234.6**	**6,942.12**	**6,760.01**	**6,691.72**	**6,462**	**100**

Table 35. GHG emissions from the Agriculture sector

Livestock population: Activity data on livestock population number were obtained from the State Statistical Committee. In addition, the data were verified against those reported by the FAOSTAT (chapter 5.2.5). Azerbaijan was not able to apply Equation 10.1 to calculate the annual average population of poultry, due to the lack of accurate data on poultry categories, and therefore the estimates of CH_4 and N_2O emissions from poultry manure management have not been conducted. However, Azerbaijan will make every effort to collect data on poultry population by sub-categories and evaluate annual average population for the entire reporting period. Nevertheless, the average annual population of sheep livestock was calculated using the data reported by the State Statistical Committee on 'Changes of sheep and goats number, by farm categories'. Specifically, the population of the born lambs was used as the basis for calculating the population of ewes. It was assumed that, on average, 1.8 lambs are born per ewe[8]. The population of breeding rams was calculated based on a ratio of 1:25[9] (breeding ram: ewes). Approximately 25% of the born offspring[10] were defined as a replacement herd (with lifespan 1 year). For the remaining population

[8] Sheep farmer field schools - A facilitators' guide (fao.org)

[9] Sheep farmer field schools - A facilitators' guide (fao.org)

[10] https://ahdb.org.uk/key-performance-indicators-kpis-for-lamb-sector#:~:text=Studies%20have%20shown%20that%20on,culling%20policy%20and%20ewe%20mortality

number of offsprings born, it was assumed that all were slaughtered in the same year they were born. These assumptions were confirmed by data on sheep slaughtering. The lifespan of meat sheep was assumed to be 5 months.

Livestock category	1990	2020	2021	2022	2023	2024
Cattle	1,541.1	2,504.0	2,519.7	2,498.2	2,399.6	2,370.2
Dairy Cows	600.6	1,211.3	1,227.2	1,231.9	1,184	1,178.6
Other Cattle	940.5	1,292.7	1,292.5	1,266.3	1,215.6	1,191.6
Buffalo	290.5	146.7	129.1	119.9	108.1	95.4
Sheep (annual average population)	2,176	3,668.0	3,613.0	3,526	3,186	3,300
Goats	194.6	605.9	585.5	580.9	419.9	394.2
Camels	0.2	0.2	0.3	0.4	0.4	0.4
Horses	36.8	60.4	58.4	56.6	53.1	49.4
Mules and Asses	29.9	23.4	21.1	20.1	14.9	12.7
Swine	156.7	5.9	6.0	5.1	4.8	3.1
Poultry *(Annual Average Population)*	4,775.5	4,960.4	4,869.7	4,897.8	4,717.5	4,814.8

Table 36. Livestock population number in 1990 and 2020–2024, thousand heads

Between 1990 and 2024, livestock populations showed diverse trends. Cattle increased by 54%, with dairy cows more than doubling (+96%), while buffalo decreased by 67%. Population of sheep and goats increased by 52% and 103% respectively, and the horse population rose by 34%. In contrast, swine dropped sharply by 98%, and mules and asses fell by 58%. Overall, dairy cows and goats saw the most significant growth, while swine and buffalo experienced the largest declines.

Poultry population estimates, based on annual production data and an average period of 60 days alive, amounted to 4,960.4 thousand heads in 2020, 4,869.7 thousand in 2021, 4,897.8 thousand in 2022, 4,717.5 thousand in 2023 and 4,814.8 thousand in 2024. The estimated annual-average population increased by 2.1% in 2024 compared with 2023, but remained 2.9% below the 2020 level.

Between 2023 and 2024, the cattle population decreased by 1.2%, including a 0.5% decline in dairy cows and a 2.0% decline in other cattle. Buffalo and goat populations decreased by 11.7% and 6.1%, respectively, whereas the sheep population increased by 3.6%.

Only Category 3.A. Enteric Fermentation (CH_4) of the Agriculture sector (including and excluding LULUCF) was added to the list of key categories in 2024.

5.2. Enteric fermentation (CRT 3.A)

5.2.1 Category description

Methane emissions from enteric fermentation amounted to 170.8 Gg CH_4 in 2024, equivalent to 4,782.6 kt CO_2-eq. This represents an increase of 50.20 Gg CH_4 (41.6%) compared with 1990 (120.61 Gg CH_4), reflecting the long-term increase in livestock populations, particularly cattle, sheep and goats. However, emissions declined by 1.50 Gg CH_4 (0.87%) between 2023 and 2024, primarily due to reductions in emissions from other cattle and buffalo. By contrast the sheep population increased by 3.6%. This category includes emissions from cattle (dairy and other cattle), buffalo, sheep, goats, horses, swine, camels, mules, and asses.

Livestock category	1990		2020 kt	2021 kt	2022	2023	2024	
	kt	%			kt	kt	kt	%
Cattle	85.04	70.51	143.13	144.2	143.29	137.65	136.2	79.74
Dairy Cows	40.84	33.86	82.37	83.45	83.77	80.51	80.2	46,96

Other Cattle	44.20	36.65	60.76	60.75	59.52	57.13	56	32.79
Buffalo	15.98	13.25	8.07	7.1	6.59	5.95	5.25	3.07
Sheep	17.41	14.43	29.34	28.90	28.21	25.49	26.4	15.46
Goats	0.97	0.8	3.03	2.93	2.90	2.1	1.9	1.11
Camels	0.01	0.0	0.01	0.01	0.02	0.02	0.02	0.01
Horses	0.66	0.55	1.09	1.05	1.02	0.96	0.89	0.52
Mules and Asses	0.30	0.25	0.23	0.21	0.20	0.15	0.13	0.08
Swine	0.24	0.2	0.01	0.01	0.01	0.01	0.01	0.01
Poultry	NA	NA	NA	NA	NA	NA	NA	NA
Total	**120.61**		184.91	184.41	182.24	172.3	170.8	**100**

Table 37. Emissions from enteric fermentation of different livestock categories, CH_4

Within the category, CH_4 emissions from enteric fermentation from cattle (dairy cows and other cattle) and sheep are deemed significant, as the emissions from these categories of livestock account for 79.74% (46.96 Dairy cows and 32.79 Other cattle) and 15.46 %, respectively in 2024. Despite the fact that enteric fermentation is a key category (table 4), the methodological choice for the significant animal species is not in line with the corresponding decision tree of the 2006 IPCC Guidelines as the Party is unable to adopt a higher-tier method for this particular key category owing to lack of resources and data.
Azerbaijan will prioritize for future improvement of the key categories for which the good practice method elaborated in the 2006 IPCC Guidelines cannot be used category owing to lack of resources and data.

5.2.2. Methodological issues

In accordance with the 2006 IPCC Guidelines, for animals that live (and cause emissions) only during certain parts of the year, the annual average population shall be calculated based on equation (10.1.).

Azerbaijan has used a tier 1 method to estimate the emissions from all livestock categories along with the IPCC default CH_4 EFs elaborated for developing countries (i.e. for sheep, goats, horses, camels and swine) and the IPCC default CH_4 EFs developed for other cattle farmed in Asia. Azerbaijan uses the IPCC Software to calculate the emissions. As poultry are monogastric and the IPCC default enteric EF was not developed in the 2006 IPCC Guidelines, the emissions were not calculated.

5.2.3. Description of any flexibility applied

See Flexibility Chapter 1.9.

5.2.4. Uncertainty assessment and time-series consistency

The uncertainty rates associated with the activity data on livestock population are insignificant because the data were collected by the State Statistical Committee, which covers a substantial number of farms and, accordingly, a significant portion of the livestock population. The uncertainty rate associated with the IPCC default EFs has also been applied in the uncertainty assessment.

5.2.5. Category-specific QA/QC and verification

FAOSTAT data was used for verification purpose, as a reference international database (included in the 2006 IPCC Guidelines in the cross-cutting chapter). Number of animals are aligned with FAOSTAT[11] figures (reported as official for the year 2024), except for very small differences. The source of information for the categorization of cattle (dairy and non-dairy) differ from the numbers that can be derived from FAOSTAT. Poultry figure is the chicken one reported in FAOSTAT[12] (turkeys are not included).

Categories	**National source**	**FAOSTAT**	
	Number of Animals	Number of Animals	Diff.

[11] https://www.fao.org/faostat/en/#data/QCL

[12] FAOSTAT

Cattle	2,399,600	2,399,626	0.00%
-Dairy Cows	*1,184,000*	*1,288,828*	*-8.28%*
-Other Cattle	*1,215,600*	*1,110,798*	*8,62%*
Buffalo	108,100	108,093	0.00%
Sheep[13]	6,640,700	6,640,708	0.00%
Goats	419,900	419,905	0.00%
Camels	400	361	9,75%
Horses	53,100	53,076	0.05%
Mules and Asses	14,900	14,962	0.42%
Swine	4,800	4,828	-0.58%
Poultry	28,698,300	28,698,000	0.00%

Table 38. Comparison of livestock numbers in 2024, FAOSTAT

In addition, general and category-specific quality control and quality assurance were performed by appropriate experts in accordance with the requirements of the IPCC guidelines and related applicable documents.

5.2.6. Category-specific recalculations

No recalculations has been conducted for this category.

5.2.7. Category-specific planned improvements

Azerbaijan will prioritize for future improvement of the key categories for which the good practice method elaborated in the 2006 IPCC Guidelines cannot be used category owing to lack of resources and data.

Moreover, Azerbaijan will make efforts to implement enhance categorization of cattle (dairy and non-dairy) as part of the improvement plan. In addition, as tier 1 was used and average gross energy intake (GE) (MJ/head/day) and average CH_4 conversion rate (Y_m) (%) were not estimated owing to lack of resources and data. The collection of disaggregated information on this activity data will be added to the improvement plan. As part of the improvement plan, it's planned to conduct consultations with the Ministry of Agriculture, national agricultural institutes and universities on possible ways to collect this data.

5.3. Manure management (CRT 3.B(a))

5.3.1 Category description

Between 1990 and 2024, CH_4 emissions from livestock categories showed substantial changes. Cattle emissions nearly doubled, increasing from 8.75 kt (74.9%) to 16.51 kt (91.8%), with dairy cows contributing the largest share, growing from 7.81 kt (66.9%) to 15.32 kt (85.2%). Other cattle saw a smaller rise in emissions, from 0.94 kt to 1.19 kt (6.6%), while buffalo emissions dropped significantly from 1.45 kt (12.4%) to 0.48 kt (2.7%). Emissions from sheep rose from 0.44 kt (3.7%) to 0.66 kt (3.7%), and emissions from goats increased from 0.04 kt (0.4%) to 0.09 kt (0.5%), though they remained small. Emissions from swine decreased sharply from 0.78 kt (6.7%) to 0.024 kt (0.1%). Emissions from horses increased from 0.08 kt to 0.108 kt, while emissions from mules and asses decreased from 0.04 kt to 0.02 kt. Camel emissions remained negligible at approximately 0.001 kt. Poultry manure-management emissions were also estimated, amounting to approximately 0.096 kt in both 1990 and 2024, corresponding to 0.8% and 0.5% of total emissions in those years, respectively. Overall, total emissions grew from 11.67 kt to 17.98 kt (+54.0%), reflecting increased contributions primarily from cattle, particularly dairy cows. Following a peak of 19.03 kt in 2021, total emissions declined to 18.99 kt in 2022, 18.13 kt in 2023 and 17.98 kt in 2024, representing a 0.9% decrease between 2023 and 2024.

Livestock category	1990		2020	2021	2022	2023	2024	
	Kt	%	Kt	Kt	Kt	Kt	Kt	%

[13] Number of animals and poultry as of 1st January

Cattle	8.75	74.9	17.04	17.25	17.28	16.61	16.51	91.8
Dairy Cows	7.81	66.9	15.75	15.95	16.01	15.39	15.32	85,2
Other Cattle	0.94	8.1	1.29	1.29	1.27	1.22	1.19	6.6
Buffalo	1.45	12.4	0.73	0.65	0.60	0.54	0.48	2,7
Sheep	0.44	3.7	0.73	0.72	0.71	0.64	0.66	3,7
Goats	0.04	0.4	0.13	0.13	0.13	0.09	0.09	0.5
Camels	0.001	0.00	0.001	0.001	0.001	0.001	0.001	0.01
Horses	0.08	0.7	0.13	0.13	0.12	0.12	0.108	0.6
Mules and Asses	0.04	0.3	0.03	0.03	0.02	0.02	0.02	0.1
Swine	0.78	6.7	0.03	0.03	0.03	0.02	0.024	0.1
Poultry	0.1	0.8	0.099	0.097	0.098	0.094	0.096	0.5
Total	11.67	-	18.93	19.03	18.99	18.13	17.98	-

Table 39. CH_4 emissions from livestock manure management systems

Due to the lack of relevant data, in the CRT tables for the category (Table 3.B(a): 3.B.1.a. - dairy cattle, 3.B.1.b. - non-dairy cattle, 3.B.4.c. - goats and 3.B.4.d. - horses), even though some animals live in warm climate regions, their share is unknown and therefore, estimations have been made according to the temperate region for all animals and the "IE" notation key has been used. In the future, the country plans to use disaggregated data to address these aspects.

For poultry, CH_4 emissions from manure management were estimated using the available national poultry data. The annual-average poultry population was calculated based on a 60-day lifespan (DA), in accordance with Equation 10.1 of the 2006 IPCC Guidelines, using the relationship (N(T)=DA* (NAP/365)), where NAP represents the annual number of poultry produced. The IPCC default typical animal mass of 2.7 kg was also applied.

5.3.2. Methodological issues

The Tier 1 approach was used to calculate CH_4 emissions from livestock manure management in the IPCC Software. The IPCC default parameters developed for Asia, corresponding to an average annual temperature of 15°C, were applied. The annual average temperature of 15°C was selected based on several national and international data sources.

CH_4 emissions from poultry manure management were also estimated using the available national poultry activity data. The annual-average poultry population was calculated using Equation 10.1 of the 2006 IPCC Guidelines, based on the number of poultry produced annually (NAP) and an assumed period of 60 days alive (DA), according to the formula (N(T)=DA*(NAP/365)). An IPCC default typical animal mass of 2.7 kg was also applied in the poultry estimates.

5.3.3. Description of any flexibility applied

See Flexibility Chapter 1.9.

5.3.4. Uncertainty assessment and time-series consistency

The uncertainty rates associated with the activity data on livestock population are insignificant because the data were collected by the State Statistical Committee, which covers a substantial number of farms and, accordingly, a significant portion of the livestock population. The uncertainty rates associated with the data on manure management systems and emission factors correspond to those reported in the 2006 IPCC Guidelines, as the IPCC software with default data was used to estimate the emissions.

5.3.5. Category-specific QA/QC and verification

General and category-specific quality control and quality assurance were performed by appropriate experts in accordance with the requirements of the IPCC guidelines and related applicable documents.

5.3.6. Category-specific recalculations

CH_4 emissions from poultry manure management were estimated for 1990 and the period 2020–2024 using available activity data and IPCC default parameters.

5.3.7. Category-specific planned improvements

The improvements described for the Enteric Fermentation category will also affect the improvements for the Manure Management category.

5.4. Manure management (CRT 3.B(b))

5.4.1. Category description 3.B(b)

Between 1990 and 2024, direct N_2O emissions from livestock manure management increased from 0.854 kt to 0.970 kt (+13.6%). Cattle emissions increased from 0.614 kt to 0.853 kt, with their contribution to total direct emissions rising from 71.9% to 87.9%. Dairy cow emissions increased from 0.108 kt to 0.211 kt, while emissions from other cattle rose from 0.506 kt to 0.641 kt. In contrast, buffalo emissions decreased from 0.166 kt to 0.055 kt, and swine emissions declined from 0.013 kt to 0.0003 kt. Poultry manure-management emissions are now included in the estimates, amounting to approximately 0.061 kt in 1990 and 0.062 kt in 2024. Poultry accounted for approximately 7.2% and 6.4% of total direct N_2O emissions in those years, respectively. Overall, direct N_2O emissions peaked at 1.061 kt in 2020 and subsequently declined to 1.052 kt in 2021, 1.034 kt in 2022, 0.989 kt in 2023 and 0.970 kt in 2024, representing a 1.9% decrease between 2023 and 2024.

Livestock category	**1990**		**2020**	**2021**	**2022**	**2023**	**2024**	
	kt	%	kt	kt	kt	kt	kt	%
Cattle	0.614	71.9	0.913	0.916	0.902	0.867	0.853	87.9
Dairy Cows	0.108	12.6	0.217	0.220	0.221	0.212	0.211	21.7
Other Cattle	0.506	59.2	0.696	0.696	0.682	0.654	0.641	66.1
Buffalo	0.166	19.4	0.084	0.074	0.069	0.062	0.055	5.7
Swine	0.013	1.5	0.001	0.001	0.0004	0.0004	0.0003	0.03
Poultry	0,061	7.2	0.063	0.061	0.063	0.060	0.062	6.4
Total (direct N_2O emissions)	0.854	100	1.061	1.052	1.034	0.989	0.970	100
Total (indirect N_2O emissions)	**0.106**	**-**	**0.213**	**0.216**	**0.217**	**0.208**	**0.207**	**-**

Table 40. Direct N_2O emissions from livestock manure management systems

Indirect N_2O emissions associated with manure management are estimated and reported separately under CRT category 3.C.6. They amounted to 0.106 kt in 1990, 0.213 kt in 2020, 0.216 kt in 2021, 0.217 kt in 2022, 0.208 kt in 2023 and 0.207 kt in 2024. Due to the lack of data on nitrogen (N) lost through leaching and discharge in the category-specific CRT table (Table 3.B(b)), N_2O emissions have not been calculated.

5.4.2. Methodological issues 3.B(b)

The Tier 1 approach was used for the calculations. Azerbaijan uses the IPCC Software to calculate N_2O emissions. The estimates of direct N_2O emissions from manure management for cattle, buffalo, and swine, and poultry were conducted. The applicable default nitrogen-excretion rates and direct emission factors (EF_3) for poultry manure-management systems were applied. The 2006 IPCC Guidelines provide a default EF_3 of 0.001 kg N_2O-N per kg of nitrogen excreted for both poultry manure with litter and poultry manure without litter. However, since the IPCC Software does not include default values for the types of manure management systems used to store and handle manure generated by sheep, goats, camels, horses, and mules, the direct N_2O emissions from manure management systems for these livestock categories were not assessed.

The estimates of indirect N_2O emissions were also carried out using the Tier 1 approach with the IPCC Software. The IPCC default parameters for FracGasMS and EF4 were used in the calculations.

The calculation of indirect N_2O emissions were not performed because the 2006 IPCC Guidelines do not provide default parameters to perform these estimates.

5.4.3. Description of any flexibility applied 3.B(b)
See Flexibility Chapter 1.9.

5.4.4. Uncertainty assessment and time-series consistency 3.B(b)
The uncertainty rates associated with the activity data on livestock population are insignificant because the data were collected by the State Statistical Committee, which covers a substantial number of farms and, accordingly, a significant portion of the livestock population. The uncertainty rates associated with the data on manure management systems and emission factors correspond to those reported in the 2006 IPCC Guidelines, as the IPCC software with default data was used to estimate the emissions. The only gap, and the corresponding impact on the overall uncertainty assessment, may result from the fact that emissions from certain livestock categories were not estimated due to the lack of default data on manure management systems.

For poultry, the uncertainty assessment also reflects the use of the assumed 60-day period alive, the calculation of the annual-average population and the application of IPCC default nitrogen-excretion rates and emission factors.

5.4.5. Category-specific QA/QC and verification 3.B(b)
General and category-specific quality control and quality assurance were performed by appropriate experts in accordance with the requirements of the IPCC guidelines and related applicable documents. In addition, those efforts conducted to verify the livestock population are one of the QA/QC activities for manure management category.

5.4.6. Category-specific recalculations 3.B(b)
The direct N_2O emissions from poultry manure management were estimated for 1990 and the period 2020–2024 and incorporated into the corresponding inventory estimates.

5.4.7. Category-specific planned improvements
N lost through leaching and run-off was not estimated owing to lack of disaggregated data. The collection of disaggregated information on the missing activity data will be added to the improvement plan. As part of the improvement plan, it’s planned to conduct consultations with the Ministry of Agriculture, national agricultural institutes and universities on possible ways to collect this data.

5.5. Rice cultivation (CRT 3.C)
5.5.1. Category description 3.C
Between 1990 and 2024, methane emissions increased from 0.274 kt to 0.761 kt. Over the same period, the rice sown area increased from 1,800 hectares to 5,003.8 hectares (+178.0%). The sown area increased from 3,001.4 hectares in 2020 to 3,085.2 hectares in 2021, 3,129.3 hectares in 2022 and 3,171.9 hectares in 2023, before reaching 5,003.8 hectares in 2024 (+57.8% compared with 2023).

5.5.2. Methodological issues 3.C
CH_4 emissions from rice cultivation were estimated following Tier 1 approach of the 2006 IPCC Guidelines using the IPCC Software. Data on areas of rice cultivated were obtained from the State Statistical Committee.

In Azerbaijan, an irrigated system with an intermittently flooded (single aeration) water regime is used for rice cultivation.

Type and amounts of organic amendments added during the rice cultivation were not estimated owing to the lack of disaggregated data.

CH_4 emissions from rice cultivation were calculated using the Tier 1 approach and are reported under CRT category 3.C, corresponding to IPCC 2006 category 3.C.7. Emissions from the irrigated rice cultivation system are reported under CRT subcategory 3.C.1, specifically 3.C.1.b.i (Single aeration). For the other CRT subcategories, 3.C.2 (Rain-fed) and 3.C.3 (Deep water), the notation key “IE” was used.

5.5.3. Description of any flexibility applied 3.C
See Flexibility Chapter 1.9.

5.5.4. Uncertainty assessment and time-series consistency 3.C
Since data on rice cultivation areas were obtained from the State Statistical Committee, which collects data at the national level, the associated uncertainty rates are considered to be low. The uncertainty rate associated with the IPCC default EFs and scaling parameters have been applied in the uncertainty assessment.

5.5.5. Category-specific QA/QC and verification 3.C
General and category-specific quality control and quality assurance were performed by appropriate experts in accordance with the requirements of the IPCC guidelines and related applicable documents.

5.5.6. Category-specific recalculations 3.C
No recalculations have been conducted for the current category.

5.5.7. Category-specific planned improvements
Type and amounts of organic amendments added during the rice cultivation were not estimated owing to the lack of disaggregated data. Therefore, the collection of disaggregated information on the missing activity data will be added to the improvement plan. As part of the improvement plan, it is planned to conduct consultations with the Ministry of Agriculture, national agricultural institutes and universities on possible ways to collect this data. These consultations will also need to explore the availability of information on rice water-management practices, to support further refinement of CH_4 emission estimates.

5.6. Direct and indirect N_2O emission from managed soils (CRT 3.D. Agricultural Soils)

5.6.1. Category description
Between 1990 and 2024, the structure of direct N_2O emissions from managed soils in Azerbaijan changed significantly. In 1990, inorganic nitrogen (N) fertilizer application was the primary source, contributing 40.3% (0.786 kt) of direct N_2O emissions. By 2024, its share had dropped to 23.0% (0.613 kt), indicating a significant reduction in its contribution. In contrast, organic N applied as fertilizer (animal manure), including the estimated contribution from poultry manure applied to agricultural soils, increased from 31.7% (0.618 kt) in 1990 to 34.5% (0.917 kt) in 2024, becoming the largest source of direct emissions. Similarly, emissions from urine and dung deposited by grazing animals nearly doubled, growing from 11.7% (0.227 kt) to 16.7% (0.445 kt). Direct N_2O emissions associated with the decomposition of crop residues left on agricultural soils more than doubled, from 0.317 kt (16.3%) in 1990 to 0.686 kt (25.8%) in 2024, reflecting the increase in crop production in Azerbaijan over this period.

Overall, direct N_2O emissions from managed soils increased from 1.948 kt in 1990 to 2.661 kt in 2024 (+36.6%). After increasing to 3.064 kt in 2023, direct emissions decreased by 13.2% in 2024. Indirect N_2O emissions from managed soils also increased, from 0.311 kt in 1990 to 0.683 kt in 2024 (+119.5%). Following an increase to 0.817 kt in 2023, indirect emissions decreased by 16.4% in 2024 (Table 41).

Category	1990		2020	2021	2022	2023	2024	
	kt	%	kt	kt	kt	kt	kt	%
Inorganic N fertilizer application	0.786	40.3	1.379	0.555	0.259	1.013	0.613	23.0
Organic N applied as fertilizer (animal manure)[14]	0.6181	31.7	0.9659	0.9681	0.9644	0.9251	0.9168	34.5

[14] [14] N_2O emissions from application of sewage sludge to agricultural soils was reported using the notation key "NE"

Urine and dung N deposited on pasture, range and paddock by grazing animals	0.227	11.7	0.457	0.463	0.465	0.447	0.445	16.7
N in crop residues	0.317	16.3	0.683	0.707	0.666	0.679	0.686	25.8
N mineralization/ immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils	NE	-	NE	NE	NE	NE	NE	NE
Cultivation of organic soils	NO	-	NO	NO	NO	NO	NO	-
Direct N_2O emissions from managed soils	1.9481	100	3.485	2.693	2.354	3,064	2.661	100
Indirect N_2O emissions from managed soils	0.3112	-	0.956	0.690	0.593	0.817	0.683	-

Table 41. Direct and indirect N_2O emissions from managed soils

5.6.2. Methodological issues

Direct and indirect N_2O emissions from managed soils were estimated following Tier 1 approach of the 2006 IPCC Guidelines using the IPCC software.

FAOSTAT[15] data was used for Nitrate-based synthetic fertilizer, as a main database due to lack of national data for 2024. However, it should be noted that FAOSTAT does not report data on the amounts of fertilizers applied to agricultural soils in 1990, as reporting begins in 1992. Therefore, it was assumed that the amounts of fertilizers applied in 1990 was the same as in 1992, since Azerbaijan had not yet undergone significant economic changes. The Party will prioritize for collection of the national data for Nitrate-based synthetic fertilizer as part of the improvement plan.

Azerbaijan does not have information regarding whether sewage sludge is used on agricultural soils for the reporting years; therefore, the notation key 'NE' was used. However, this category will be included in the improvement plan for further examination.

The estimates of N_2O emissions due to animal manure applied to soils, and urine and dung deposed by grazing animals were estimated using the IPCC Software. Hence, the activity data on animal population and the default data on manure management systems, as well as ratios of manure used for construction and fuels were applied (i.e., 0).

Direct N_2O emissions from crop residues left on the fields were calculated using the tier 1 approach and default parameters embedded in the IPCC software (i.e., the 2006 Guidelines' defaults). The data on annual crop areas and yields have been obtained from the national statistics (Table 42).

Years	Rye	Barley	Wheat	Oats	Grain maize	Millet	Pulses
1990	1.1	190.0	368.6	3.1	12.9	-	6.6
2020	0.3	345.0	588.4	5.8	33.7	0.1	12.7
2021	0.3	373.7	572.3	6.4	32.2	0.2	10.5
2022	0.2	386.3	547.2	6.3	30.5	0.2	11.8
2023	0.2	356.5	542.8	5	28.6	0.2	11.7
2024	0.2	420.6	546.4	5.3	29.2	0.2	14.2

[15] https://www.fao.org/faostat/en/#data/RFN

Table 42. Cultivation area of annual crops, kha[16]

The data on production areas and yields for perennial crops (i.e., grass) have not been considered in the current submission, due to lack of complete dataset needed to conduct the estimates.

Direct N_2O emissions due to N mineralization/immobilization associated with the loss/gain of soil organic matter resulting from changes in land use or management of mineral soils for 2024 were assessed using the IPCC software, ensuring consistency in activity data with the LULUCF sector. Direct N_2O emissions for this sub-category were reported as 'NO' because there were no carbon losses due to management changes in cropland remaining cropland and grassland remaining grassland for agriculture.

The estimates of indirect N_2O emissions from the management of the agricultural soils were estimated using tier 1 using the IPCC Software. For the Total N loss from MMS $Frac_{lossMS}$ the default values were applied from Table 10.23, Chapter 10, Volume 4 AFOLU of 2006 IPCC guidelines. For similar animals the same fraction was applied (Dairy/Other Cattle/Buffalo). MMS $Frac_{lossMS}$ amounted to 30 was applied for Dry lot Manure Management system type for swine to estimate the N_2O emissions. Owing to limited time constraints and lack of disaggregated data, the N_2O emissions for swine were not estimated partially. As a result of the lack of these data, it can be assumed that the amount of N manure available to be applied to agricultural soils is slightly overestimated.

5.6.3. Description of any flexibility applied

See Flexibility Chapter 1.9.

5.6.4. Uncertainty assessment and time-series consistency

The uncertainty rates associated with the IPCC default EFs and IPCC fractions have been applied in the uncertainty assessment. As for the uncertainty rates associated with the activity data, the data on the amounts of fertilizers applied to agricultural soils are the most uncertain, as they were taken from an international source (FAOSTAT).

5.6.5. Category-specific QA/QC and verification

General and category-specific quality control and quality assurance were performed by appropriate experts in accordance with the requirements of the IPCC guidelines and related applicable documents.

5.6.6. Category-specific recalculations

In the current submission, N_2O emissions from managed soils are estimated for the inventory time series, including 1990 and 2020–2024. The recalculations incorporate updated activity data and the inclusion of poultry manure nitrogen in the estimates of organic nitrogen available for application to managed soils, where applicable.

5.6.7. Category-specific planned improvements

Nitrate-based synthetic fertilizer: The Party will prioritize for collection of the national data for Nitrate-based synthetic fertilizer as part of the improvement plan.

Sewage sludge: Sewage sludge applied to soils and Crop residues were not estimated owing to lack of disaggregated data. The collection of disaggregated information on the missing activity data will be added to the improvement plan. As part of the improvement plan, it's planned to conduct consultations with the Ministry of Agriculture, national agricultural institutes and universities on possible ways to collect this data.

Total N loss from MMS $Frac_{lossMS}$: MMS FraclossMS, amounting to 30, was applied for the Dry Lot Manure Management system type for swine to estimate N_2O emissions. Due to time constraints and a lack of disaggregated data, N_2O emissions for swine were only partially estimated, which affected the amount of N in manure available to be applied to agricultural soils. The collection of disaggregated information on total N losses (in fraction, $Frac_{lossMS}$) from manure management system will be added to the improvement plan. This information will be used to calculate the amount of N manure available to be applied to agricultural soils. As part of the improvement plan, it's

[16] Agriculture, forestry and fishing | The State Statistical Committee of the Republic of Azerbaijan

planned to conduct consultations with the Ministry of Agriculture, national agricultural institutes and universities on possible ways to collect this data.

5.7. Prescribed burning of savannahs (CRT 3.E) and Field burning of agricultural residues (3.F)

CH_4 and N_2O emissions from prescribed burning of savannahs are not occurring in the country. According to law on waste[17] and law on atmospheric air protection[18] burning activities are prohibited in the country. Therefore, the notation key "NO" was used to indicate the emissions due prescribed burning of savannahs in 2024. However, since the law on waste came into effect in 1998 and law on air protection came into force in 2001, no activity data is available for 1990, Azerbaijan used the notation key "NE".

The same law implies field burning of agricultural residues category and all activity data underlying the estimates for this category. Hence, the same notation keys were used for 1990 and 2024. Azerbaijan will prioritize future improvements in identifying if field burning of agricultural residues takes place.

5.8. CO_2 emissions from liming, urea application and other carbon-containing fertilizers (3.G-J)

5.8.1. Category description

CO_2 emissions due to urea application to the agricultural soils made up 0.071 kt in 2024

5.8.2. Methodological issues

Liming: CO_2 emissions from liming were not estimated owing to lack of disaggregated data on liming activities. Azerbaijan will prioritize future improvements in identifying liming activities take place.

Urea application: CO_2 emissions from urea application were estimated following Tier 1 approach of the 2006 IPCC Guidelines.

Years	National source	FAOSTAT
	Amount of Urea	Amount of urea imported
2024	97.9	716.62
2023	60.4	637.34
2022	20.3	380.28
2021	95.7	1,439.53
2020	212.4	11,179.89
1990	NO	NO

Table 43. Comparison of urea application numbers

Other carbon-containing fertilizers: The 2006 IPCC Guidelines do not provide a specific method and EF for this category and therefore it is not considered as a mandatory category.

5.8.4. Uncertainty assessment and time-series consistency

The activity data on the amounts of urea applied to agricultural soils have a low uncertainty rate, as the data were obtained from the State Statistical Committee, which collects data at the national level. The uncertainty rate associated with the IPCC EFs have been applied in the uncertainty assessment.

5.8.5. Category-specific QA/QC and verification

FAOSTAT data was used for verification purpose, as a reference international database: amount of urea applied in the country is not aligned with FAOSTAT[19] figures (reported as official for the year 2024) of imported urea applied for agricultural use. In the next submission, Azerbaijan will make efforts to improve data collection for urea application as part of the improvement plan.

[17] https://e-qanun.az/framework/3186

[18] https://e-qanun.az/framework/3515

[19] https://www.fao.org/faostat/en/#data/RFB

İn addition, general and category-specific quality control and quality assurance were performed by appropriate experts in accordance with the requirements of the IPCC guidelines and related applicable documents.

5.8.6. Category-specific recalculations

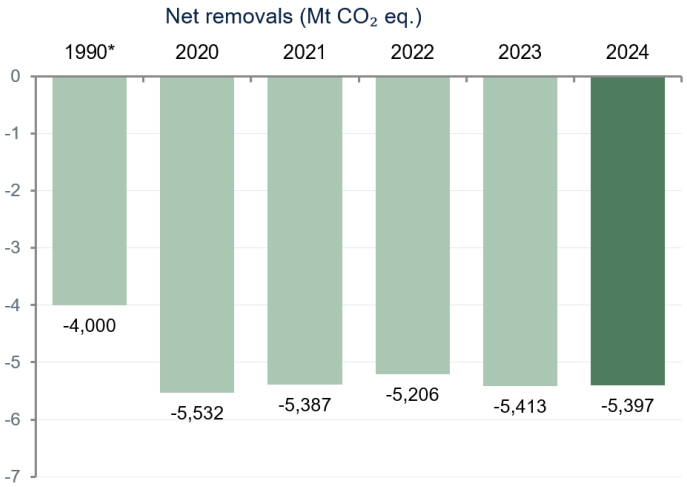
No recalculations have been performed for this category.

5.8.7. Category-specific planned improvements

Azerbaijan will make every effort to collect the missing data needed to estimate emissions from this category.

6. Land Use, Land Use Change and Forestry (CRT Sector 4)

Land Use, Land-Use Change and Forestry (LULUCF)



AREAS FOR IMPROVEMENT

1 Land Representation Matrix
Establishing a consistent, reliable and regularly updated matrix reflecting land categories, transitions and changes over time.

2 Strengthening Inter-institutional Coordination
Strengthening data exchange and coordination with the State Property Service and other institutions for the development and updating of the matrix.

3 Reliability of Land-Use Data
Improving the consistency, comparability and methodological transparency of land-use and land-cover data.

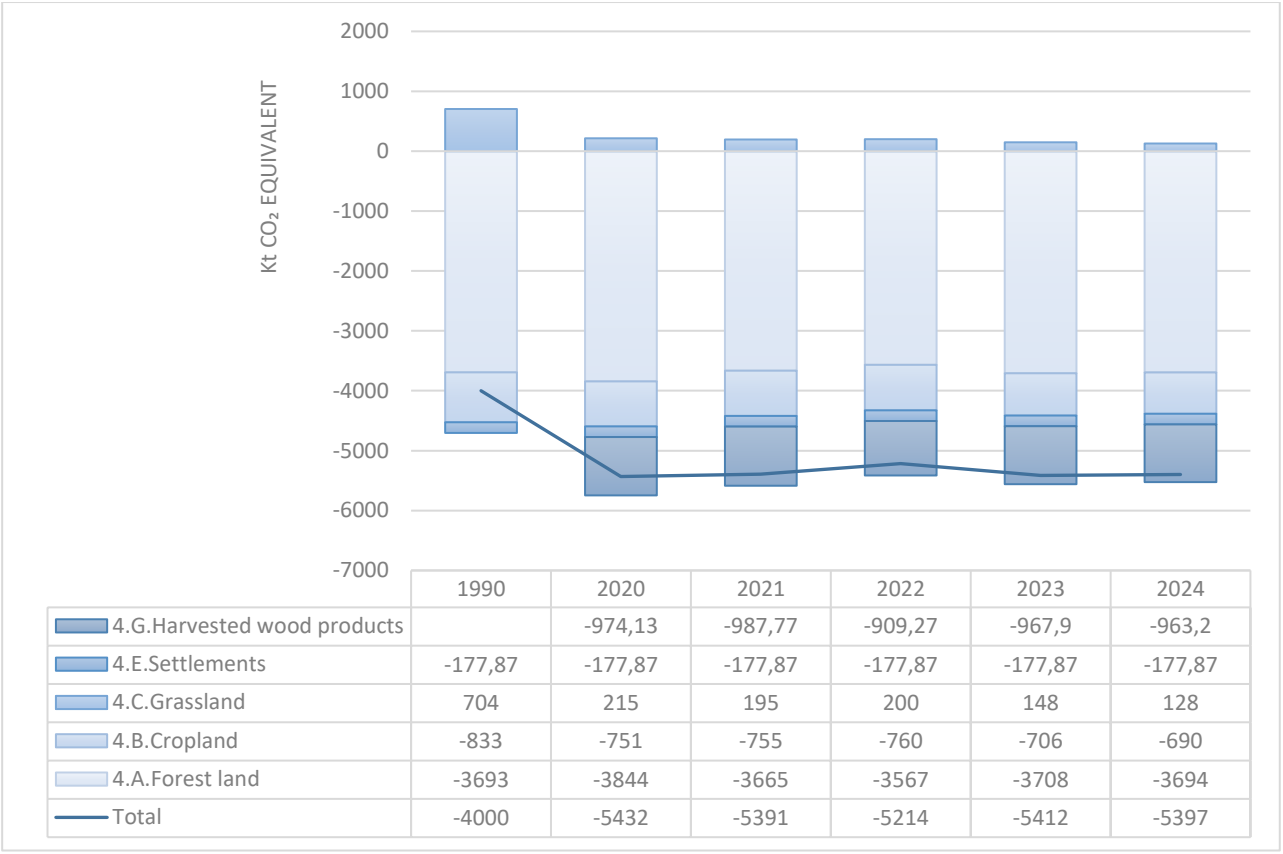
4 MRV for Forestry and Carbon Market Opportunities
Strengthening capacities to monitor and assess forest carbon stocks and changes in these stocks. Reliable climate reporting provides a foundation for future participation in carbon markets.

TER note: The Technical Expert Review of BTR-1 raised questions regarding the collection of land representation data and the methodology applied. The main need is to clearly document the links between administrative land records, Earth observation data, and the categories and transitions used in the inventory.

6.1 Sector overview (CRT Sector 4)

In the LULUCF sector (CRT 4), reporting includes both emissions and removals to the atmosphere.

The analysis of the key categories was conducted considering the LULUCF and without it, using the base year of 1990 and the most recent inventory year of 2024. The Forest Land (4.A.1) was indicated as a key category. However, due to resource constraints and time limitations, the country is not capable of applying a higher-tier methodology for these categories. Azerbaijan applied the 2006 IPCC Guidelines Tier 1 approach for emission and removal sources in all land use categories. Emissions and removals from the LULUCF sector have been calculated using the IPCC software. Nevertheless, it should be noted that significant efforts will be required to ensure that the GHG inventory in the LULUCF sector of Azerbaijan meets the requirements of the TACCC quality principles stipulated in the 2006 IPCC Guidelines and to collect country-specific AD for the entire historical period, as well as relevant EFs and underlying key parameters. Namely, in the future, Azerbaijan will prioritize further improvements, gathering the necessary data and taking appropriate measures to estimate emissions/removals using higher-tier methodologies.



	1990	2020	2021	2022	2023	2024
4.G.Harvested wood products		-974,13	-987,77	-909,27	-967,9	-963,2
4.E.Settlements	-177,87	-177,87	-177,87	-177,87	-177,87	-177,87
4.C.Grassland	704	215	195	200	148	128
4.B.Cropland	-833	-751	-755	-760	-706	-690
4.A.Forest land	-3693	-3844	-3665	-3567	-3708	-3694
Total	-4000	-5432	-5391	-5214	-5412	-5397

Figure 46. CO_2 emissions/removals by land use category

As shown in Figure 46, significant changes in carbon emissions/removals have occurred due to land use changes between 1990 and 2024. The removals in 1990 amounted to -4,000 kt CO_2, which gradually increased to -4,461kt CO_2 by 2024. As the activity data on HWP was not available for the 1990, removals for the HWP category were not estimated, so this category was not considered when comparing removal levels between 2024 and 1990. The most noticeable changes were observed in Forest land and Cropland land use categories. There was a slight increase in removals by Forest land from 1990 (-3,693 kt CO_2) to 2020 (-3,844 kt CO_2). However, this decreases slightly in 2021 (-3,665 kt CO_2) and 2024 (-3,694 kt CO_2), indicating forests may be absorbing slightly less carbon in recent years. The removals by cropland (mineral soils) decreased from 1990 (-833 kt CO_2) to 2022 (-760 kt CO_2), and it decreased from 2022 to 2024 (-690 kt CO_2). Grassland land use category (mineral soils) demonstrated a decrease in emissions over time. In 1990, it contributed 704 kt CO_2 of carbon emissions, but by 2020, this dropped to 215 kt CO_2, and continues to decrease to 128 kt CO_2 by 2024. It is important to note that one of the main reasons for the significant changes in the amount of CO_2 emissions and removals related to land management and use in the cropland and grassland categories is due to the application of the approach 1 to determine the land use representation. Thus, this approach encompasses all emissions/removals during land reclassification. This may result in double or underestimation of emissions or removals for grassland and cropland categories. However, these inconsistencies can be fully balanced in inventory and are expected to be improved in future submissions.

6.2. Land use concepts and approaches for land representation and their consistency with LULUCF categories

The total area of the country is 86,600 thousand hectares (kha). Azerbaijan used the approach 1 for land representation.

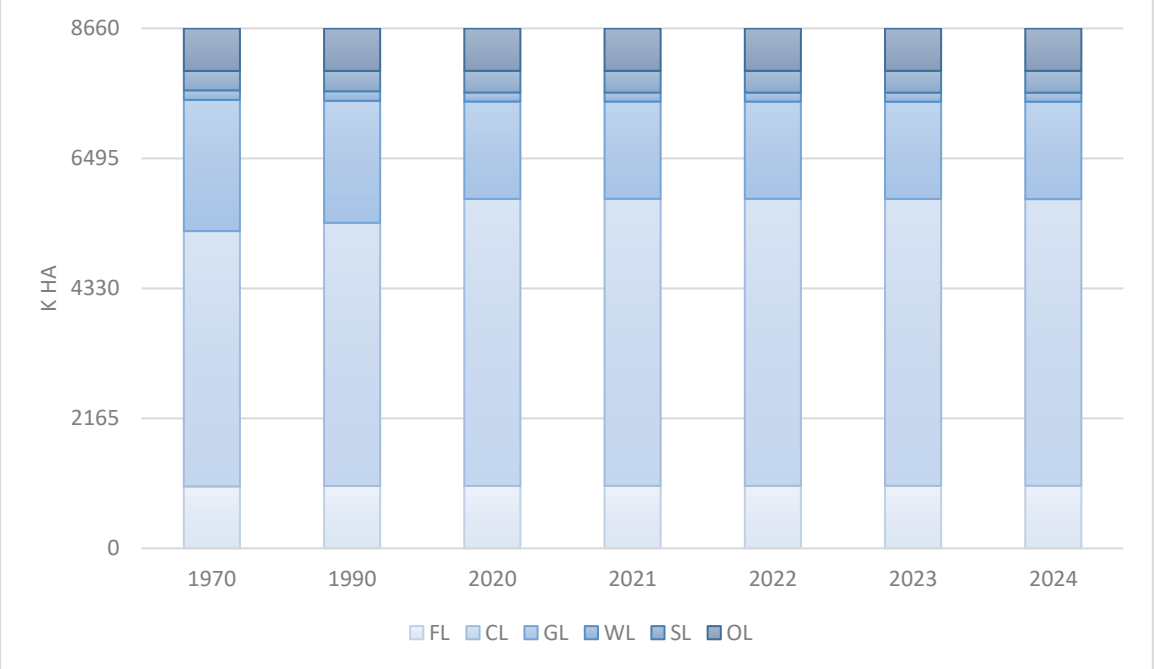


Figure 47. Areas of land use categories in 1970-2024

The data on land categories used in the inventory was taken from the data provided by the SSC, which is consistent with the land use definitions of the 2006 IPCC guidelines. The national understanding of the LULUCF sector is compliant and compatible with the categories of the LULUCF sector from the IPCC 2006 Guidelines.

For each year presented, the areas assigned to the six land-use categories sum to 8,660 kha, corresponding to the total area of the country.

6.3. Country-specific approaches

6.3.1. Approaches used to determine land representation and land use databases used in inventory preparation

The primary source of information was the State Statistical Committee. These entities provide collected statistical data on cropland areas (by land use sub-category) and forest land for the period from 1970 to 20243. Data sources for settlement areas are described in Chapter 6.8. Data on areas of Wetlands and Other Land (by land use sub-category) for the reporting years were interpolated and extrapolated using values from a dataset developed by the Statistical Committee[20] for 2000 and 2015. Additionally, information from online resources[21] was examined to confirm the evaluated trends. The areas of the Grassland category (by sub-category) were also obtained based on data published by the Statistical Committee[22] for 2000 and 2015, which were further extrapolated and interpolated considering the collected data on cropland and forest land areas.

The national definitions and data on areas were mapped to those developed and reported in the 2006 IPCC Guidelines to ensure consistency in the reporting. It should be noted that the national concepts for the LULUCF sector are almost similar and consistent with the subcategories of the IPCC LULUCF sector. The data presented in Table 44 represent the mapping table developed for 2022.

[20] Land cover accounts of the Republic of Azerbaijan, ha (based on Earth observation data)

[21] World Bank Document and National Encyclopedia of Azerbaijan

[22] Land cover accounts of the Republic of Azerbaijan, ha (based on Earth observation data)

	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land
Forest land	1,040.7					
Arable land		2,052.8				
Fallow land		39.1				
Permanent crops (fruit trees)		273.6				
Hayfields and pastures (used for agricultural purpose)		2,415.0				
Shrub cover/ bush/ heathland			1,467.0			
Heterogeneous natural vegetation & transitions			113.3			
Other vegetation areas			38.7			
Open wetlands				2.6		
Inland water[23]				147.9		
Built-up areas					362.6	
Bare rocks/ sand/ burnt areas						670.2
Permanent snow and glaciers						0.2
Archipelagos						36.4

Table 44. National definition for land use categories and relevant land use categories defined by the 2006 IPCC Guidelines in 2022, kha

However, it should be noted that due to resource constraints and time limitations during the current reporting period, the land representation does not ensure the application of minimum stratification required (i.e., forest lands) by the 2006 IPCC Guidelines. Improvement plans for ensuring stratification are described in the improvement section of the report. Azerbaijan is situated in warm temperate dry climate according to the 2019 IPCC Refinement (Figure 3A.5.1 of Chapter 3, Volume 4).

Moreover, Azerbaijan is in the process of developing data on conversion from one land use category to another (i.e., Tier 2 approach for land representation), which will allow for a more accurate estimates of emissions and removals. This activity has been included in the improvement plan.

There have not been provided any statistical data on organic land conversions and drainage/re-irrigation activities in the country. Due to time constraints and lack of data, emissions from organic soils and drainage/reirrigation activities have not been estimated. All areas were defined as those located on mineral soils. Azerbaijan will investigate the availability of organic soils in the country and categorize them based on land use. This activity will be included in the improvement plan. As part of the improvement plan, it is planned to conduct consultations with the Ministry of Agriculture, national agrarian universities, and research centers on possible ways for collecting this data.

Since Tier 1 approach was applied to classify and identify land use areas and to estimate the GHG inventory in the LULUCF sector, hence, all emissions and removals have been reported under a relevant 'land remaining land' category (e.g., Forest land remaining Forest land) in the same land use category. The concept of land use change related to unmanaged land has not been found in national statistics. However, the 2006 IPCC Guidelines clarified that natural rivers and lakes should

[23] The category includes inland rivers and reservoirs

be classified as unmanaged lands (p.3.6 of chapter 3, volume 4). Azerbaijan will review these areas in the future and will consider reclassifying some areas reported in this submission as wetlands to be unmanaged lands. In general, the refinement of land representation for the next period is regarded as part of the improvement plan.

6.3.2. Information on approaches used for reporting harvested wood products

See section 6.10 for harvested wood products (HWP) (CRT 4.Gs1).

6.3.3. Sector-specific planned improvements

There is a list of planned improvements relevant to the entire LULUCF sector. Information regarding these improvements is provided in Chapter 10.

Classification of land use:

Azerbaijan is going to develop a sustainable classification system taking into account national conditions.

To facilitate the application of the Tier 2 or Tier 3 approach in accordance with the 2006 IPCC Guidelines it is planned to deploy the FAO soil collection tool with an appropriate methodological approach for soil presentation in the next reporting period.

Stratification:

Because of resource constraints and time limitations, in the current report, land representation does not encompass the application of minimum stratification based on climate, ecological zone, soil, and management regime according to the 2006 IPCC Guidelines. Azerbaijan plans to stratify the country's total area in accordance with the 2006 IPCC Guidelines and will present this in the next BTR report.

Organic soils and drainage/re-irrigation activities:

Due to data gaps and time constraints, emissions and removals from organic soils and drainage and rewetting activities have not been estimated. These issues are planned to be addressed through updated land representation including the identification and classification of organic soils and the estimation and reporting of relevant emissions and removals from organic soils and drainage and rewetting activities, where applicable. To apply the Tier 1 methodology in the subcategory, necessary data will be collected, ensuring compliance with the 2006 IPCC Guidelines and standardizing data collection protocols.

Trainings:

- Conducting trainings on the methods of data collection, analysis, and reporting for government agencies, scientific institutions, researchers, and stakeholders.
- Organization of seminars and trainings on IPCC methodologies and best practices for land management.

6.4. Forest land (4.A.)

6.4.1 Category description

In Azerbaijan, forest land is a net sink. GHG emissions from this land use category primarily occur due to forest biomass harvest and forest fires.

According to the SSC, forests covered approximately 12% of the country’s territory in both 1990 and 2022. The calculations for the area of land use categories are described in detail in Section 6.2. Data regarding forest land is provided in Table 45.

Years	1990	2020	2021	2022	2023	2024

Area	1,038.8	1,040.3	1,040.7	1,040.7	1,040.7	1,042.1

Table 45. Data on forest land, ha

Despite the fact that Tier 1 approach was used for land representation, Azerbaijan would like to provide some facts/information on the conversion from/to forest land, which will be polished in the future submission. Namely, it is noteworthy that, according to the data from the MENR, no forest areas were converted to cropland areas or other land types between 2000 and 2016. The results indicate that there is very little forest loss in Azerbaijan, particularly with a zero conversion to croplands. This is attributed to the natural regeneration occurring in forests destroyed during the occupation period (over 54 kha), abandoned habitations and croplands, and Azerbaijan's forest policy implemented, including forest protection, afforestation, and reforestation activities.

The results of the GHG inventory of the forest land category indicate a decline in net CO_2 removals from forest lands in the country between 1990 and 2024. The total CO_2 removals by forest lands were -3,693.2 kt CO_2 in 1990. However, this figure has slightly decreased over the past 30 years, reaching -3,694.2 kt CO_2 in 2024, despite the increase in the area of forest land. Overall, it can be noted that living biomass was the most significant sink over the considered period, followed by mineral soils (Figure 48).

GHG emissions in the Forest category were calculated using the IPCC 2006 guidelines'. The results of the GHG inventory for the Forest Land category indicate a declining trend in net CO_2 removals in forest land between 1990 and 2022.

According to calculations based on the IPCC 2006 guidelines, total CO_2 removals by forest land were -3,693.2 kt CO_2 in 1990. However, despite an increase in forest areas over the last 30 years, this figure has slightly increased to -3,694.2 kt CO_2 in 2024. Furthermore, CO_2 removal by biomass increased from -3,510.5 kt CO_2 in 1990 to -3,605.3kt CO_2 in 2024.

Despite the growth in forest areas, removals in this category have slightly decreased over the last 30 years, reaching -3,694.2 kt CO_2 in 2024. Overall, it can be said that living biomass has been the most significant source of removals during the period under consideration, followed by mineral soils.

According to the calculations, CO_2 sequestration by mineral soils has shown more variation. In 1990, removals were -182.6 kt CO_2, which significantly declined to -69.7 kt CO_2 by 2020. However, without any major cause, this figure rose again in 2024, reaching -88.93 kt CO_2 equivalent (see Figure 48).

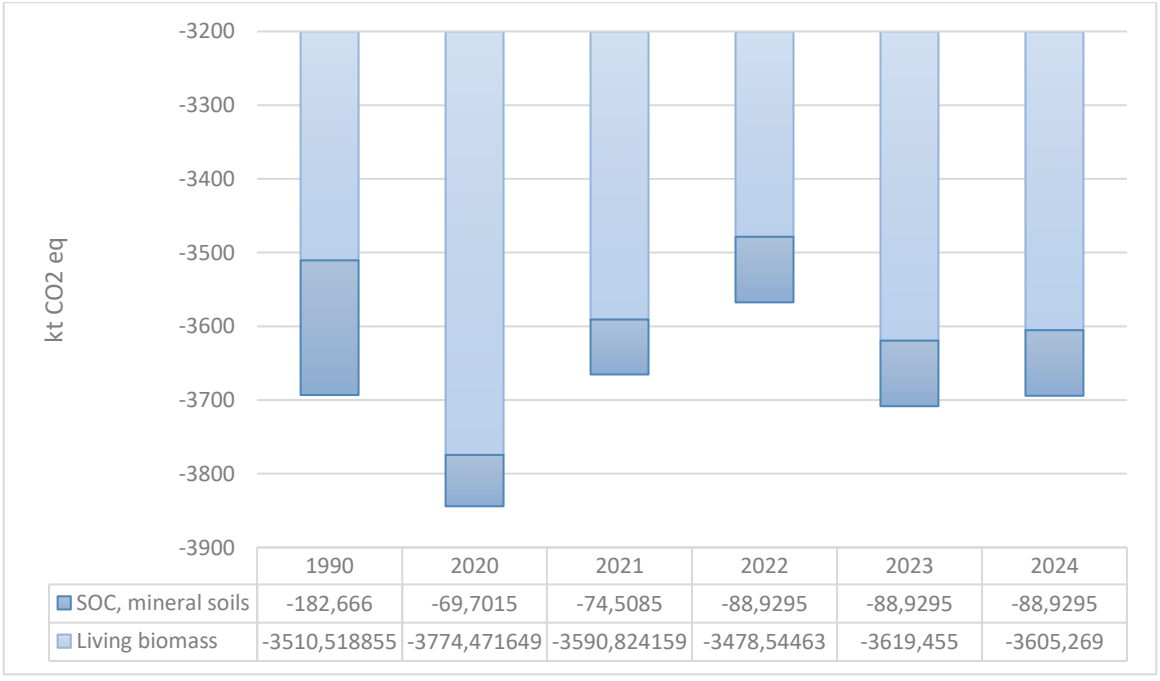


Figure 48. Removals from Forest land

It is observed that the forest lands are not converted into agricultural lands for farming purposes. The results show that forest loss in Azerbaijan is minimal, with particularly no conversion into agricultural lands. This is due to Azerbaijan's forest policy, which includes forest protection, afforestation, and forest restoration activities.

Although the Level 1 approach has been used for land reporting, Azerbaijan plans to collect data related to forest land/forest land conversion, which will be considered in future reports.

6.4.2. Methodological issues

GHG emissions in the forest land use category have been estimated using ahe Tier 1 method within the IPCC software. Since approach 1 of the 2006 IPCC Guidelines was used for land representation and the IPCC software have been deployed to classify land representation and further to estimate GHG emissions from forest lands, all emissions/removals are reported solely for the category "Forest Lands Remaining as Forestland." The area of organic soils and changes in net carbon stocks in organic soils are not estimated, as there is no specific data available regarding organic soils within forest areas. Changes in Tier 1 carbon stock are assumed to be zero in dead trees and woody debris, hence the use of the notation key "NA" ("Not Applicable"). The gain-loss method was applied to assess annual changes in living biomass.

Azerbaijan's forests consist of a mix of broadleaf and coniferous species, with various growing stock levels depending on the forest types and regions. The forest types include:

- Temperate broadleaf and mixed forests;
- Coniferous forests;
- Semi-arid forests.

However, due to resource constraints and time limitations, stratification by forest type has not been applied in the current report (the entire forest area is considered as a single stratum). As a result, the calculations did not take into account different mean annual increment values. According to Azerbaijan's Global Forest Resources Assessment 2020 Report (FRA)[24], the average growing stock level was 172 m^3/ha. In the future reporting period, it is planned to estimate the average incremental reserve level depending on forest types based on IPCC guidelines and available regional data.

The average annual increment has been assumed to be 3 m^3/ha/year, in accordance with the 2006 IPCC Guidelines (Volume 4, AFOLU, Chapter 4: Forest Lands, Table 4.11B). This figure is considered relevant for the forest types found in Azerbaijan. Based on the forest types available in Azerbaijan, which include both temperate and some boreal elements, the average annual increment can be roughly estimated within the following ranges:

- Broadleaf forests: about 2-4 m^3/ha/year
- Coniferous forests: about 3-6 m^3/ha/year
- Semi-arid forests: about 1-3 m^3/ha/year

Consequently, country-specific average annual increment indicators have not been used in the calculations. However, the average annual increment will be assessed in future reporting periods in accordance with the IPCC general guidelines and available regional data.

According to the 2006 IPCC methodology, Volume 4, Chapter 2, Table 2.6, a default parameter of 0.45 for the fraction of biomass lost in the disturbance has been selected for all "other" temperate forests.

The data on forest biomass harvest have been obtained from national statistics. Namely, three datasets were used to create a consolidated table of the volume of wood harvested from forests: industrial roundwood supply, fuelwood supply (including statistics on fuelwood supply and removal, as well as information on illegal logging), and data on tree residues collected as a result of sanitation measures (Table 46).

[24] Global Forest Resources Assessment (FRA) 2020 Azerbaijan - Report (fao.org)

	1990	2020	2021	2022	2023	2024
Roundwood and fuelwood biomass	183.7	82.6	133.3	141.1	143.3	148.4
Tree parts collected from forest	62.3	62.5	60.7	67.4	69.4	78.2

Table 46. Data on industrial and fuelwood supply and tree parts collected from forests, thousand m^3

The latest activity data indicate an increase in roundwood and fuelwood biomass from 143.3 thousand m^3 in 2023 to 148.4 thousand m^3 in 2024. The volume of tree parts collected from forests increased from 69.4 thousand m^3 to 78.2 thousand m^3 over the same period.

The estimation of carbon sequestration/emissions from mineral soils has been conducted using Formula 2.25 and default values of the 2006 IPCC Guidelines, with the support of the IPCC Software. The data on country-specific SOC values for mineral soils have been obtained from the FAO GloSIS resourse[25]. The data were overlapped with the land cover map developed by national experts and published in a scientific journal[26]. SOC was taken to range from 60 tC/ha to 191 tC/ha, taking into account the area relevant to the different SOC values (e.g., 20% of the forest mineral soil area has an SOC content of 60 tC/ha, while only 7% has 191 tC/ha. The remaining area falls within intermediate values in this range).

6.4.3. Description of the flexibility applied

See Flexibility Chapter 1.9.

6.4.4. Uncertainty estimation and time series consistency

Since the data are obtained from international sources, the uncertainty levels in the existing biomass stock, biomass growth rate, and activity data related to wood supply are considered relatively high. However, the uncertainty levels regarding forest land areas are classified within an average uncertainty range because the data is sourced from national databases. As the 2006 IPCC Guidelines and IPCC software were used to estimate emissions, the uncertainty levels for various parameters and emission factors correspond to those specified in the 2006 IPCC Guidelines.

6.4.5. Category-specific QA/QC and verification

Category-specific quality control and quality assurance have been conducted by relevant experts based on the requirements of the IPCC Guidelines and associated documentation.

6.4.6. Category-specific recalculations

Recalculations were made in connection with updating activity data for 1990.

6.4.7. Recalculations were made in connection with updating activity data for 1990.

Planned improvements for the country are described in the relevant section for the Forest land category:

- Investigating additional detailed data for forest land stratification by forest types.
- Obtaining national data on various growing stock levels and average annual growth values (depending on forest types).

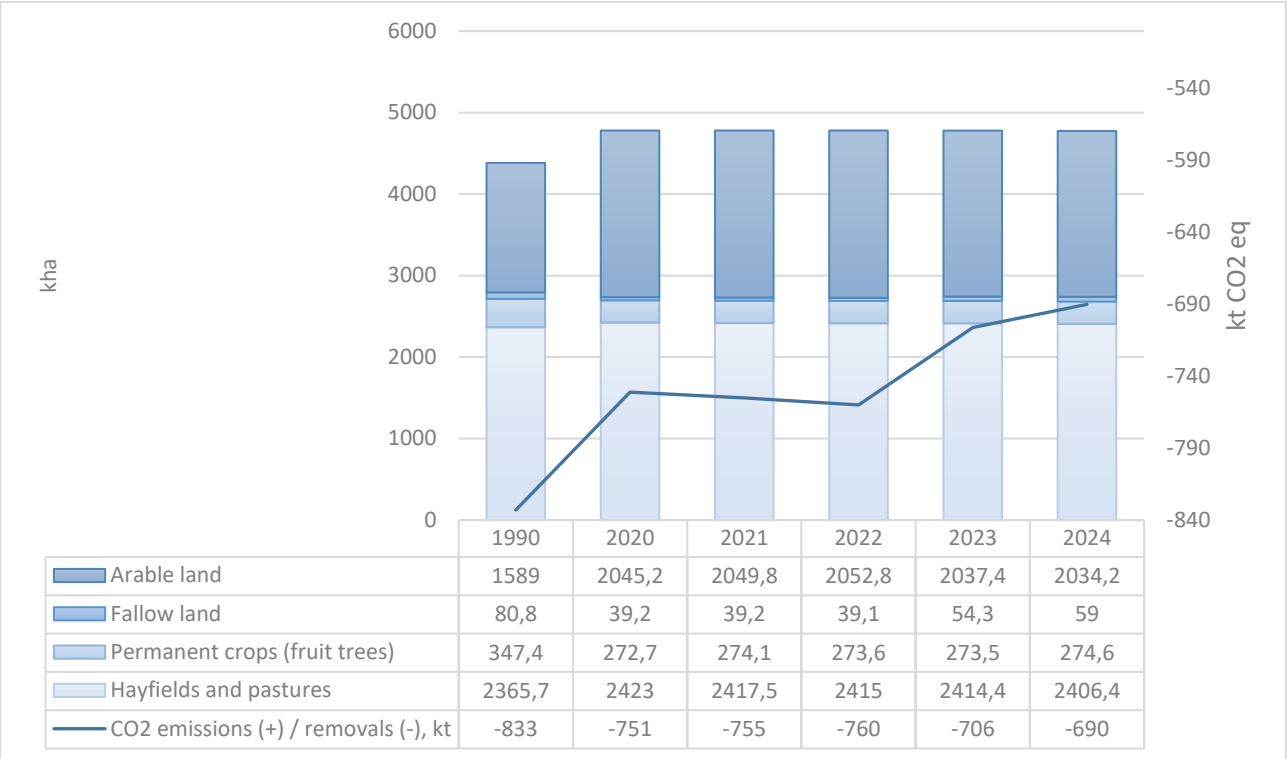
6.5. Croplands (4.B.)

6.5.1 Category description

From 1990 to 2024, the area of croplands was steadily increased: from 4,382.9 kha (51% of the total land area) in 1990 to 4,774.2 kha (55% of the total land area) in 2024 (Figure 49). The increase in areas occurred primarily due to the expansion of the hayfield and pasture land use category, as well as arable land. The changes in land use resulted in net CO_2 removals by mineral soils: from -832.9 kt CO_2 in 1990 to -690.1 ktC O_2 in 2024 (Figure 49).

[25] FAO GloSIS

[26] (11) (PDF) Site selection for solar photovoltaic system installation using analytical hierarchy process model in Azerbaijan (researchgate.net)



	1990	2020	2021	2022	2023	2024
Arable land	1589	2045,2	2049,8	2052,8	2037,4	2034,2
Fallow land	80,8	39,2	39,2	39,1	54,3	59
Permanent crops (fruit trees)	347,4	272,7	274,1	273,6	273,5	274,6
Hayfields and pastures	2365,7	2423	2417,5	2415	2414,4	2406,4
CO2 emissions (+) / removals (-), kt	-833	-751	-755	-760	-706	-690

Figure 49. Cropland area and associated CO_2 emissions/removals

6.5.2. Methodological issues

A Tier 1 approach of the 2006 IPCC Guidelines is applied to estimate CO_2 emissions or removals by mineral soils under cropland land use category. The changes in biomass of fruit trees were not evaluated due to the lack of data and the time constraints. Hence, CO_2 emissions/removals related to changes in other carbon sources are reported using the notation keys “NE” (Not Estimated) and “NA” (Not Applicable).

According to the SSC, cropland areas are divided into four subcategories (as it was demonstrated in Figure 49):

- Arable land
- Fallow land
- Perennial crops (fruit trees)
- Hayfields and pastures used for agriculture purposes

The 2006 IPCC guidelines were served as a reference to assign relative stock change factors for different land-use and management practices to estimate CO_2 emissions/removals (Table 47). The FAO GloSIS resourse,[27] together with the land cover map developed by national experts and published in a scientific journal[28], were consulted to obtained country-specific SOC values. SOC was taken to range from 27.26 tC/ha to 50.13 tC/ha, taking into account the area relevant to the different SOC values.

[27] FAO GloSIS

[28] (11) (PDF) Site selection for solar photovoltaic system installation using analytical hierarchy process model in Azerbaijan (researchgate.net)

Parameter	Arable land	Reference[29]	Fallow land[30]	Fruit trees	Reference[31]	Hayfields and pastures	Reference[32]
Land use (F_{LU})	0.8	Long-term cultivated - Temperate/Dry	0.8	1.0	Perennial/ Tree Crop - All	0.82	Set aside (< 20 yrs)
Tillage (F_{MG})	1.0	Full - All	1.0	1.0	The same values as for Arable land	1.00	The same values as for Arable land
Input (F_I)	1.04	High – with manure	1.0	1.0		1.00	

Table 47. Key parameters used for estimating CO_2 emissions/removals resulting from changes in cropland management practices

These parameters are derived from stock change factors provided for in the 2006 IPCC Guidelines (Table 5.5, Chapter 5, Volume 4). However, Azerbaijan is planning to collect more information on cropland land use management practices, which will subsequently influence the factors (values) reflected in the table above. Specifically, the results will be refined based on alternative data and expert opinions. It is planned to closely cooperate with the State Service on Property Issues and the State Statistical Committee to clarify the situation regarding land use changes in the harvested lands under the improvement plan.

The area of organic soils and the change of net carbon stock in organic soils have not been estimated.

6.5.3. Description of the flexibility applied

See Flexibility Chapter 1.9.

6.5.4. Uncertainty estimation and time series consistency

The uncertainty levels associated with croplands are classified in the high uncertainty range. As standard emission factors for key parameters were used to estimate emissions from the 2006 IPCC Guidelines and IPCC software in the calculations, uncertainty levels are consistent with those reported in the 2006 IPCC Guidelines.

6.5.5. Category-specific QA/QC and verification

General and category-specific quality control and quality assurance were carried out by experts in compliance with the requirements of the IPCC guidelines and relevant documents.

6.5.6. Category-specific recalculations

No recalculations have been performed for this category.

6.5.7. Category-specific planned improvements

As part of the improvement plan, it is planned to closely cooperate with the State Service on Property Issues and the State Statistical Committee in order to clarify the situation regarding the land use change in cropland areas (including the land use change in harvested lands) and to collect information on the country. Additional information on cropland management practices, including tillage practices, input levels and the management of fallow land and perennial crops, will also be sought to improve the selection of stock change factors and the estimation of CO_2 emissions and removals.

[29] Table 5.5 of chapter 5, volume 4

[30] F_{LU} and F_{MG} are the same as for Arable land. F_I – Medium - All

[31] Table 5.5 of chapter 5, volume 4

[32] Table 5.5 of chapter 5, volume 4 and Table

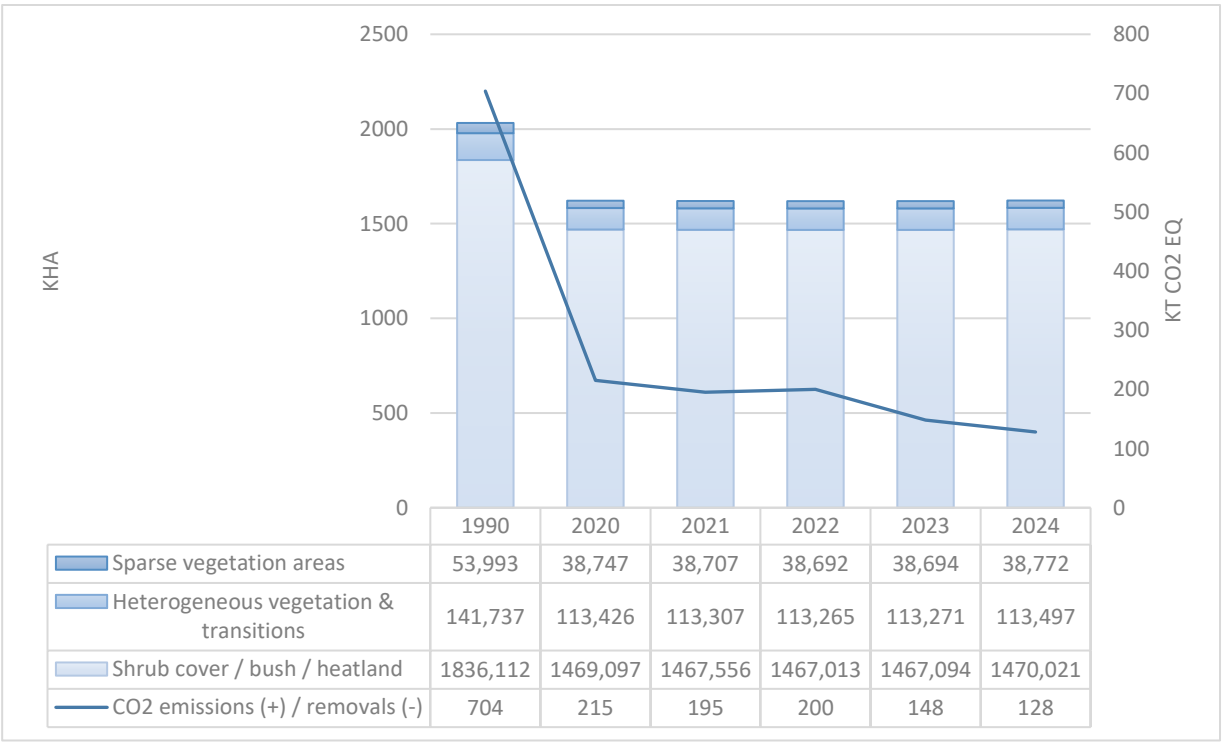
6.6. Grasslands (4.C.1)

6.6.1. Category description

In Azerbaijan, grasslands are divided into summer grasslands (located at altitudes above 1500 m above sea level) and winter grasslands (located at altitudes up to 100 m above sea level), which sharply differ from each other due to the mineralization of their soil. The pastures (grasslands) used for grazing can be natural and artificial (sown or seeded). Natural grasslands consist of perennial grass-steppe, semi-desert grasses, ephemeral plants, and semi-shrubs and bushes. Artificial grasslands are created based on a mix of perennial and annual cereal grasses and legume plants. In Azerbaijan, natural meadows and pastures are mainly located in Gobustan, Jeyranchol, Ajinohur, Shirvan, Mil, Karabakh, and Salyan plains, covering 67% of natural pastures, and in the mountains, such as the Greater and Lesser Caucasus and Talysh, covering medium mountainous, subalpine, and alpine zones, making up 33% of natural grasslands. Summer pastures are located after the forest zone of the Greater and Lesser Caucasus mountains, at an altitude of about 1500–2500 m. And winter pastures are mainly located in the lowland regions. Although no assessment has been made for carbon stocks in grasslands, it is visually apparent that summer pastures have higher carbon stocks.

Recently, as a result of the uncontrolled cattle grazing in summer pastures, the grasslands are subjected to intensive erosions, which prevent these lands from adequately supplying livestock with necessary forage. During heavy rainfall, severe water runoff occurs in these areas, washing away and degrading the soil. Overgrazing in summer pastures has also caused erosions of the grasslands at varying levels. The main part of the Lesser Caucasus summer pastures (350,319 ha), which is the second fodder base of livestock breeding in Azerbaijan, has been under Armenian occupation for more than 30 years. The impossibility of utilizing these pastures has undoubtedly had a negative impact on the effective use of other summer pastures. Research findings indicate that the relocation of livestock from regions that previously used summer pastures in occupied areas to the summer pastures in the Greater Caucasus has degraded the vegetation cover and accelerated erosion processes in those areas.

From 1990 to 2024, there occurred considerable changes in grassland areas. The total grassland area decreased from 2,031.8 kha in 1990 to 1,662.4 kha in 2002. These changes have led to significant alterations in CO_2 emissions within the category. While CO_2 emission from the grassland use and management was 703.5 kt in 1990, it sharply decreased to 127.8kt in 2024 (Figure 50).



	1990	2020	2021	2022	2023	2024
Sparse vegetation areas	53,993	38,747	38,707	38,692	38,694	38,772
Heterogeneous vegetation & transitions	141,737	113,426	113,307	113,265	113,271	113,497
Shrub cover / bush / heatland	1836,112	1469,097	1467,556	1467,013	1467,094	1470,021
CO2 emissions (+) / removals (-)	704	215	195	200	148	128

Figure 50. Grassland area and associated CO_2 emissions/removals

However, as mentioned in section 6.1, the Tier 1 approach was applied for the estimation of emissions in the Grasslands section of the total land area. In the land use change report, only emissions/removals from the "remaining land as cropland" subcategory are considered under the Tier 1 approach. In this case, emissions or removals from the Grassland and Cropland subcategories may be double-counted or incorrectly assessed. These discrepancies will be clarified during the full inventory process and improved in the future.

6.6.2. Methodological issues

The Tier 1 approach of the 2006 IPCC Guidelines was applied to estimate GHG emissions from grasslands. Estimated emissions and removals are reported for Grasslands remaining Grassland (4.C.1.). The approach selected by Azerbaijan can lead to potential under- or over-estimation of emissions or removals from the Grassland and Cropland subcategories. However, these discrepancies will be clarified during the full inventory processes and improved in the future.

Emissions for mineral soils were produced using the 2006 IPCC default relative carbon stock change parameters and data on SOC values reported in the FAO GloSIS resource[33] together with the land cover map developed by national experts and published in a scientific journal[34]. SOC was taken to range from 27.78 tC/ha to 37.7 tC/ha, taking into account the area relevant to the different SOC values. The values from Table 6.2 (Chapter 6, Volume 4) were used: F_{LU} was applied as 1.00 (developed for All level – All climate), FMG – calculated as a weighted average for non-degraded and moderately degraded grassland, and FI –developed for Medium level – All climate.

There is no information on changes in carbon stocks in living biomass in grasslands. Therefore, changes in living biomass have not been assessed. Moreover, due to the lack of data on the area of organic soils and their species composition, carbon stock changes in organic soils are not estimated. Azerbaijan will make efforts to collect data and conduct relevant estimates in the future submissions.

6.6.3. Description of the flexibility applied

See Flexibility Chapter 1.9.

6.6.4. Uncertainty estimation and time series consistency

Uncertainty levels related to cropland areas have been classified within an average uncertainty range, as activity data has been obtained from national sources. Uncertainty levels for various key parameters and emission factors are consistent with those reported in the 2006 IPCC Guidelines because IPCC default emission factors and IPCC software have been used to estimate emissions.

6.6.5. Category-specific QA/QC and verification

General and category-specific quality control and quality assurance have been carried out by experts in accordance with the requirements of the IPCC guidelines and related documents.

6.6.6. Category-specific recalculations

No recalculations have been performed for this category.

6.6.7. Category-specific planned improvements

As part of the improvement plan, it is intended to closely cooperate with the State Service on Property Issues and the State Statistical Committee to clarify the situation regarding land use changes and collect activity data across the country.

6.7. Wetlands (4.D.1)

6.7.1 Category description. (4.D.1)

All public sources indicate that no land in Azerbaijan is classified as peatland. In the article “Mires and Peatlands of Azerbaijan,” published by “Thiele et al," it is stated that during the years 2005-2007 there were conducted research works on peat lands in the country. According to the results of the research, peatlands cover a very small area and therefore are considered completely insignificant. Consequently, it is assumed that methane gas emissions from these areas are

[33] FAO GloSIS

[34] (11) (PDF) Site selection for solar photovoltaic system installation using analytical hierarchy process model in Azerbaijan (researchgate.net)

negligible. Since there is no CH_4 present in waterlogged areas, the notation key “NE” has been applied to this category.

Industrial peat extraction (4.II).

This field of activity is not found in Azerbaijan (NO).

Peat fires (4.V).

This field of activity is not found in Azerbaijan (NO).

However, Azerbaijan will make all efforts to gather relevant data and perform necessary calculations regarding waterlogged areas (if applicable to the national conditions).

Additionally, as it was indicated in table 44, the Wetlands category includes areas of natural rivers and lakes, and reservoirs. Azerbaijan will review these sub-categories in the future submissions and will consider to re-classify the natural rivers and lakes as unmanaged lands.

6.8 Settlements (4.E.1)

6.8.1. Settlements (4.E.1)

In calculating GHG emissions for this category, data on the areas of settlements (residential areas) was obtained from the State Statistical Committee (see Table 48).

Years	1990	2020	2021	2022	2023	2024
Residential areas	338	361.1	361.9	362.6	363.4	364.2

Table 48. Changes in the areas of residential areas, thousand ha

There is high level of uncertainty in settlements data. In light of this, it is planned to conduct further research to obtain more accurate data.

However, since the data of the SSC were obtained early, the inventory work was carried out based on the available information. The level of CO_2 removals in mineral soils under the residential areas of the country was estimated at -177.87 kt CO_2 over the whole reporting period.

6.8.2. Methodological issues

Azerbaijan applies the 2006 IPCC Guidelines using the Tier 1 approach for the assessment of emissions from residential buildings. Thus, all calculations of emissions and removals have been conducted for residential buildings remaining as residential areas (4.E.1).

Unlike other land use categories, all residential areas are classified under a warm, temperate, humid climate. To establish a minimum stratification of residential areas based on climate, ecological zones, soil types, and management regimes, it is planned to implement relevant measures within the framework of future improvements.

To calculate CO_2 emissions/removals from mineral soils resulting from changes in land use or management practices, relevant emission factors have been used as default baseline values of the 2006 IPCC Guidelines as well as the IPCC software.

Due to the lack of data regarding organic soils in residential areas, the area of organic soils and changes in net carbon stocks of these soils have not been estimated. Similarly, there is no available data on carbon stock changes in living biomass in residential areas.

In residential areas of Azerbaijan, the above-ground biomass stock is usually lower than that in natural forests because the density of vegetation is less.

The average above-ground biomass stock applied in residential areas is 15 Ton DM/ha, with a ratio of below-ground biomass to above-ground biomass set at 0.229. These values for average above-ground biomass and the ratio of below-ground to above-ground biomass have been calculated based on national conditions.

Due to the presence of infrastructure and managed green spaces (such as parks, gardens, and roadside vegetation), residential areas typically exhibit lower biomass density compared to natural forests. Above-ground biomass refers to all living plants above the soil, including trees, shrubs, and other vegetation. The IPCC suggests using lower biomass density values for tree-covered residential areas, which can be approximately 15–25 Ton DM/ha.

The 2006 IPCC Guidelines provide default values for aboveground biomass stocks for various land use categories. However, specific values for residential areas are not directly provided. In this case,

references have been made to the values for similar land categories, such as sparse and low-density forest areas.
Although the IPCC does not present specific values for residential areas, it can be concluded that due to urbanization and land use changes, the above-ground biomass stocks are significantly lower than natural forests. Given that residential areas have much less vegetation cover compared to natural forests and include their mixed uses (as well as buildings, parks, etc.), above-ground biomass is conservatively estimated to be 15 Ton DM/ha as the lowest value.
Due to resource constraints and time limitations during the current reporting period, a value for typical forest land was used for the ratio of belowground biomass to aboveground biomass, according to the 2006 IPCC Guidelines (Table 4.4). Tree-covered areas in residential buildings differ from woody areas in temperate natural broadleaf forests, where the above-ground biomass exceeds 125 t/ha. According to the 2006 IPCC Guidelines (Table 4.4), the ratio of belowground biomass to aboveground biomass in greenery within residential areas is 0.229.
In the estimation of emissions from residential areas, the values of the 2006 IPCC Guidelines for typical forest lands were used due to the lack of other information. In future reporting periods, it is planned to improve the estimation of average above-ground biomass and the ratio of below-ground to above-ground biomass for Azerbaijan based on the types of residential areas in accordance with the IPCC general guidelines and available regional data. The improvement plan includes close collaboration with the Forest Development Service of the MENR to clarify the situation regarding land use changes in residential areas.
The carbon fraction value of biomass used is set at 0.5 t C/Ton DM according to the 2006 IPCC Guidelines.

6.8.3. Description of the flexibility applied
See Flexibility Chapter 1.9.

6.8.4. Uncertainty estimation and time series consistency
As activity data are obtained from national sources, uncertainty levels have been classified within an average uncertainty range. Uncertainty levels for various key parameters and emission factors are consistent with those reported in the 2006 IPCC Guidelines, as default values of the 2006 IPCC Guidelines and IPCC software have been used to estimate emissions.

6.8.5. Category-specific QA/QC and verification
General and category-specific quality control and quality assurance have been carried out by experts in accordance with the requirements of the IPCC guidelines and related documents.

6.8.6. Category-specific recalculations
No recalculations have been performed for this category.

6.8.7. Category-specific planned improvements
As part of the improvement plan, it is planned to collaborate closely with the Forestry Development Service of the MENR, SSC and SSPI to clarify the situation regarding land plots used for residential space and greenery in the residential areas. Besides, in the future reporting period, it is planned to estimate country-specific parameters for assessing changes in living biomass sources, to verify residential buildings depending on their types and to implement them in accordance with the IPCC Guidelines and existing regional data.

6.9. Other lands (CRT 4F)
Generally, the “other lands” category consists of non-vegetated areas (see table 44 in chapter 6.3.1). As part of the improvement plan, it is intended to closely cooperate with the State Service on Property Issues and the SSC to clarify the situation regarding land use changes within the “other lands” category.

6.10. Harvested wood products (CRT 4.Gs1)

6.10.1. Category description
The category represents a net source with a stable level of CO_2 emissions, exceeding 900 kt CO_2 annually.

6.10.2. Methodological issues
To calculate emissions and removals related to the use of harvested wood products, the Tier 1 approach was applied, using the IPCC software. It should also be noted that due to the lack of relevant national data, FAOSTAT (https://www.fao.org/faostat/en/#data/FO) data have been used, alongside the tool (MS-Excel file) of the IPCC Harvested Wood Products (HWP).

6.10.3. Description of the flexibility applied flexibility
See Flexibility Chapter 1.9.

6.10.4. Uncertainty estimation and time series consistency
Uncertainty levels for various key parameters and emission factors comply with those provided in the 2006 IPCC Guidelines as IPCC software with default data was used to estimate emissions.

6.10.5. Category-specific QA/QC and inspection
General and category-specific quality control and quality assurance have been carried out by experts in accordance with the requirements of the IPCC guidelines and related documents.

6.10.6. Category-specific recalculations
No recalculations have been performed for this category.

6.10.7. Category-specific planned improvements
As part of the improvement plan, the country will prioritize the collection of more up-to-date activity data related to the utilization of trees for their intended use, including their felling, harvesting, and sanitary logging.

Azerbaijan intends incorporating carbon stock changes into HWP areas using the minimum Tier 1 approach, in accordance with the 2006 IPCC Guidelines. The assessment of carbon stock changes in HWP pools is planned as one of the improvement activities.

6.11. Non-CO_2 emissions (CRT 4(I), 4(II), 4(III), 4(IV))
6.11.1. Category description
Non-CO_2 emissions have been evaluated and reported solely as a result of biomass burning in forest lands, as outlined in the LULUCF chapter. In 2022, emissions reached their highest level for the reporting period due to a expansion of wildfires (Figure 51).

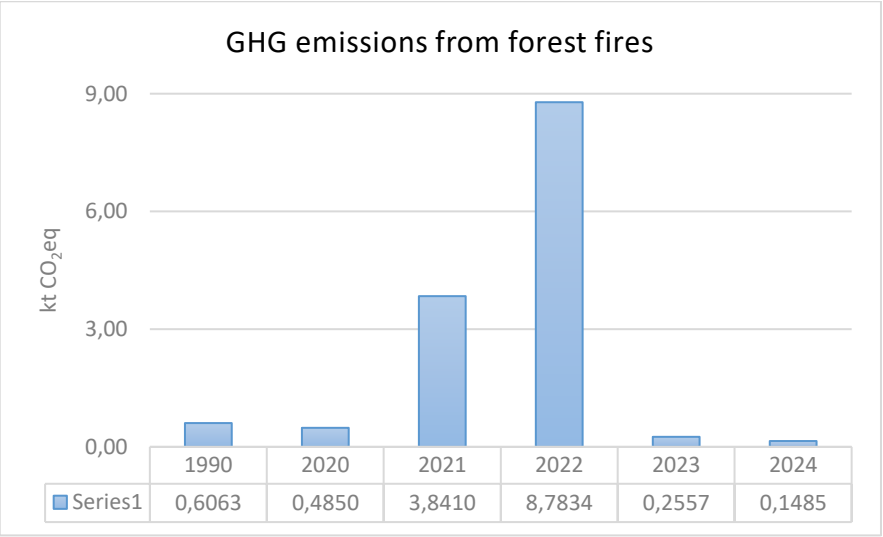


Figure 51. GHG emissions related to forest fires in Azerbaijan, kt CO_2 eq.

6.11.2. Methodological issues
Direct and Indirect N_2O emissions from the application of nitrogen (N) fertilizers on managed lands (CRT 4(I)). Due to the lack of disaggregated data on fertilizer application by land use category, all emissions resulting from fertilizer application have been reported in the Agricultural sector.

No statistical data have been provided regarding organic land conversion and drainage/rewetting activities for the subcategory of *emissions and removals (CRT 4(II)) from drainage, re-irrigation, and other management of organic and mineral soils.* Azerbaijan will exert every effort to investigate whether drainage, rewetting, and other management activities of organic and mineral soils exist in the country and, if so, to collect relevant information. Due to the absence of the necessary activity data, the associated emissions and removals have not been estimated (NE).
Direct and indirect N_2O emissions r*esulting from nitrogen mineralization/immobilization (CRT 4(III))* due to soil organic matter loss/generation as a result of land-use change or mineral soil management have been calculated and considered in the Agricultural sector (immobilization process) related to mineral soil loss/generation caused by land use changes in croplands and pastures or mineral soil management.
However, assessment of direct and indirect N_2O emissions due to N mineralization/immobilization associated with mineral soils in residential areas has not been carried out, given the lack of appropriate IPCC standard parameters and the negligible nature of these emissions.
Biomass burning (CRT 4(IV)) subcategory - according to national legislation, burning activities are prohibited in the country to prevent uncontrolled fires that could spread to neighboring areas and other land use categories. Consequently, the notation key "NO" has been used to report GHG emissions for the Cropland (4(IV).B.) and Grassland (4(IV).C.) subcategories. The application of "NO" reflects the inventory assumption that biomass-burning activities do not occur in these categories. This classification should be supported by national activity information, as the legal prohibition of burning alone does not establish that the activity does not occur.

National statistical data have been used for activities related to forest areas affected by fire (Table 49). The calculation of emissions has been conducted using the IPCC software, applying the default values of the 2006 IPCC Guidelines (e.g., combustion coefficient, CH_4 EF).

Years	1990	2020	2021	2022	2023	2024
Areas affected by fire	186	48.0	380.1	869.2	25,3	14,7

Table 49. Areas of fire-affected forests in Azerbaijan, ha

6.11.3. Description of the flexibility applied
See Flexibility Chapter 1.9.

6.11.4. Uncertainty estimation and time series consistency
Standard data have been deployed following the 2006 IPCC Guidelines on uncertainty levels for various key parameters and emission factors, and IPCC software has been used to estimate emissions.

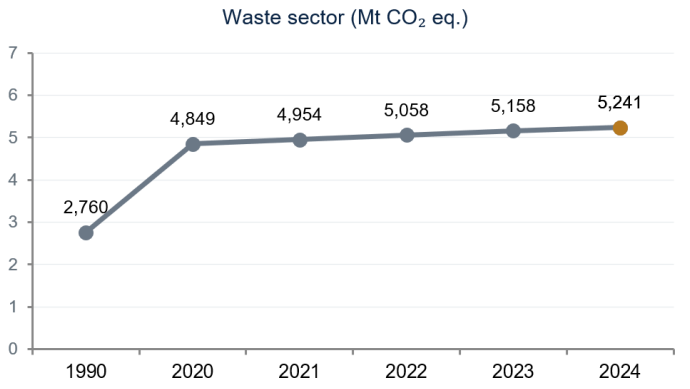
6.11.5. Category-specific QA/QC and inspection
General and category-specific quality control and quality assurance have been carried out by experts in accordance with the requirements of the IPCC guidelines and related documents.

6.11.6. Category-specific recalculations
Recalculations have been performed in connection with updating activity data for 1990.

6.11.7. Category-specific planned improvements
Every effort will be made to improve the collection of country-specific data and the estimation of non-CO_2 emissions.

7. Waste and Waste Water (CRT Sector 5)

Waste Sector



Sector-wide change: Approximately +89.9% compared with 1990 (2.760 → 5.241 Mt CO_2 eq.).

4.A Solid Waste Disposal (CH_4)

+3,25% (2024 compared with 2023; category-level change)

The volume of solid waste increased by 11.2% in 2024; the amount of waste sent for incineration remained almost unchanged.

Tier 2 — First Order Decay (FOD) Model

The FOD model accounts for the accumulation of organic carbon in landfills and its gradual decomposition over time.
Activity data: Annual waste quantities from official statistics; missing data for the period before 2007 are extrapolated.
Incineration data are obtained from Təmiz Şəhər and include an estimation component.

LIMITATIONS

Particularly outside Baku, it is difficult to reliably determine the composition of waste by type and identify landfills receiving waste from different regions. This limits the accuracy of estimates of the types and quantities of waste entering each landfill.

IMPROVEMENT PRIORITIES

Improving regional data on waste generation, composition, transportation and disposal; strengthening historical data; and documenting the assumptions used in the FOD model and in the estimation of incineration.

7.1. Overview of the Waste and Wastewater Sector (CRT Sector 5)

The waste sector, which is the fourth sector adopted in the IPCC (2006) methodology, is represented as the fifth sector in the CRT tables, following LULUCF. The main GHGs in this sector are methane (CH_4), and nitrous oxide (N_2O). In the waste sector, municipal solid waste and wastewater are the primary sources of GHG emissions.

The problem of municipal solid waste management has become one of the most acute economic and environmental issues. As the amount of waste grows, so do the GHG emissions generated by it. According to the SSC's data, organic food waste, plastic products, polyethylene bags, construction materials and other waste are on the rise due to the country's rapid industrial and population growth. The latest data gathered in compilation of this inventory submission indicates per capita MSW generation has reached approximately 295 kg/capita/year in 2024, the highest value estimated to date. For context, the estimated value was under 200 kg/capita/year in 2018.

Treatment and disposal of industrial and municipal solid waste in industrial and urban areas leads to the generation of GHG emissions. Solid waste can be managed through disposal, recycling or energy recovery (where waste is directly used as fuel).

The two main sources of methane generation, the most important gas in this sector, are landfills and wastewater treatment.

The quantitative and qualitative composition of biogas depends on the climatic and geological conditions of the landfill, the morphological and chemical composition of waste, disposal conditions (area, volume, density), moisture, compaction and other factors. Gas emissions produced in landfills result from the biological breakdown of the organic waste. The source of biogas is the biodegradable waste fractions, which make up 60-80% of solid waste, including garbage, waste from public catering facilities, paper and other organic waste.

Azerbaijan applies the Tier 1 methodology for all waste categories, using available data. In the coming years, category-specific improvement plans will be developed to increase country-specific data collection and develop higher-level methods (focusing on key categories). Information on these improvements is provided in the relevant subsections of the waste category below.

Domestic and industrial wastewater is discharged into appropriate sewers through sewage systems. When treated or discharged under anaerobic conditions, wastewater can generate CH4. N2O emissions can also occur through nitrogen transformation processes during wastewater treatment and following the discharge of treated effluent. CO2 emissions from wastewater are not included in the inventory in accordance with IPCC methodology, as the carbon is considered to be of biogenic origin.Sewer collectors in Baku and other large cities and regions of Azerbaijan are usually closed and located underground. Wastewater in closed, underground sewer collectors is not considered to be a significant source of CH_4 emissions.

After treatment, domestic wastewater generated by human activities is discharged into the aquatic environment (river, lake, sea, etc.). Direct N_2O emissions can occur during nitrification and denitrification of nitrogen.

In 1972, given the prospective population growth, the “Great Sanitation” project of Baku was developed and construction work began. During this period, the Hovsan Aeration Station, sewage pumping stations, the “Industrial Zone”, “Shaharkanari-Tunnel” and “Sahil” tunnel collectors were built and put into operation. As a result, approximately 85% of the wastewater generated in Baku was collected and discharged into the sea after treatment at purification facilities. However, in 1991, construction under the “Great Sanitation” project was halted due to financial shortages. It was only in 2006-2007 that reconstruction projects in the capital's sewerage network were restarted. The largest project undertaken on these works was the “Project of reconstruction and ensuring of Hovsan Treatment Plant Stations, Zig Pumping Station No.2 and Basic Conductor Sewerage collectors”. As a result, the capacity of the Hovsan Treatment Plant was increased from 480,000 m^3/day to 640,000 m^3/day. At present, there is a separated (isolated) sewage system in Baku. The total length of household sewage lines is 1,500 kilometers. Besides, there are rainwater sewer lines with a total length of 156 kilometers in Baku. To facilitate wastewater management and improve operational efficiency in the capital, construction of tunnel-type sewer collectors based on new technologies has commenced. Overall, the volume of wastewater discharged from the sewage lines of Baku city exceeds one million cubic meters per day. The daily capacity of the 72 existing sewage pumping stations in Baku is close to one million cubic meters.

Waste water treatment facilities in Baku:

- Hovsan biological treatment facilities - capacity of 640 thousand cubic meters/day
- Sahil biological treatment facilities - capacity of 17.5 thousand cubic meters/day
- Buzovna biological treatment facilities - capacity of 10 thousand cubic meters/day
- Zigh mechanical treatment facilities - capacity of 70 thousand cubic meters/day
- Khojahasan mechanical treatment facilities - capacity of 18.6 thousand cubic meters/day
- Mardakan-Shuvelan mechanical treatment facilities - capacity of 18.6 thousand cubic meters/day

Currently, sewerage networks and treatment facilities are being constructed in cities and towns throughout the country. Waste incineration has been taking place since 2013. At this stage, minimal data is available. However, it is understood that biogenic food waste is the predominant waste type incinerated. As such, resultant CO_2 emissions are biogenic and do not contribute to national totals. Negligible emissions of CH_4 and N_2O are reported from this source.

Table 50 provides information on GHG emissions from the Waste sector.

Categories	1990	2020	2021	2022	2023	2024	1990-2024, difference %
5.A. Disposal of solid waste	1,005.42	2,336.12	2,395.5	2,470.4	2,553.7	2,636.6	162.2
5.B. Biological treatment of solid waste	NE	NE	NE	NE	NE	NE	NA

5.C. Incineration and open burning of waste	**NO**	9.3	8.8	8.6	9,3	9,4	NA
5.D. Wastewater treatment and discharge	1,754.1	2,504	2,549.2	2,578,5	2,594.7	2,595.2	48

Table 50. GHG emissions from the Waste sector, kt CO_2 eq.

7.2 Solid waste disposal on land (5.A)

The category of solid waste disposal is a key category of CH_4 emissions in terms of emission levels and trends.

According to the latest inventory estimates, CH4 emissions from solid waste disposal increased from 35.91 Gg in 1990 to 94.16 Gg in 2024, corresponding to an increase of 162.2%. Between 2023 and 2024, CH4 emissions increased from 91.20 Gg to 94.16 Gg (3.2%). In CO2-equivalent terms, emissions increased from 2,553.72 kt in 2023 to 2,636.61 kt in 2024.

In Azerbaijan, proper management of landfills and dumpsites is only provided at the Balakhani landfill of the capital city of Baku. Here are carried out processes such as biological treatment, sorting and incineration of waste. This category includes the calculation of CH_4 emissions resulting from the anaerobic decomposition of waste accumulated in municipal solid waste disposal sites (SWDS).

Areas such as intra-city roads, streets, squares, parks, boulevards, public buildings and structures, settlements, etc. are considered the main sources of household (domestic) waste discharged into the environment. Municipal solid waste is the main type of waste polluting the environment.

The organized management of dumpsites in the country began in the 1950s. The first managed waste landfill in the country was established in the Balakhani settlement of the capital city of Baku.

In connection with the implementation of the “Comprehensive Action Plan for the Improvement of the Environmental Situation in the Republic of Azerbaijan for 2006-2010”, the Order “On improving household waste management in Baku” was signed and “Tamiz Shahar” OJSC was established for the management of the city's waste.

In the activities of the company, the Balakhani city waste disposal landfill, one of its economic fields, holds special significance. The landfill was rehabilitated and transformed into a sanitary landfill within the framework of the “Integrated Solid Waste Management (Unified Management of Solid Waste)” project, implemented on the basis of the loan agreement between the Ministry of Economy and the World Bank. The total area of the landfill is 120 ha. As a result of the works performed, grounding works were carried out in an area of about 60 hectares, and respectively, 2.9 million m² of the area was completely covered with various special-purpose isolation layers (geogrid, geotextile, geomembrane, etc.). A total of 26 special cells were built for waste disposal at the landfill and the area was equipped to handle the disposal of approximately 10 million tons of waste. Additionally, a special treatment plant operating with reverse osmosis technology was installed to treat the wastewater collected at the landfill. Here, the wastewater separated from waste is converted into technical water through special filters and used for irrigation purposes. The biogas generated from the decomposition of organic waste is used to produce electricity through a special generator with a capacity of 2 MW. In order to promote waste sorting and develop the recycling business in the country, a semi-automatic Balakhani municipal solid waste sorting plant with an annual capacity of 200,000 tons, operating with German technology, was built in Balakhani settlement. As a result of sorting at the plant, recyclable materials such as paper, glass, plastic, metal and other raw materials are separated, which reduces the total volume of waste, forms a market for cheap raw materials, creates a basis for the establishment of recycling industries in the country, saves energy, and most importantly, reduces the negative impact of waste on the environment.

According to the activity data reported in the CRT, the total quantity of waste deposited in solid waste disposal sites, including managed, unmanaged and uncategorised sites, amounted to 3,631.15 Gg in 2023 and 3,759.79 Gg in 2024. The 2024 estimates comprise 1,520.51 Gg deposited in managed sites, 1,734.13 Gg in unmanaged sites and 505.15 Gg in uncategorised sites. Compared with 2023, the total quantity of waste deposited increased by approximately 3.5% in 2024.

Methane emissions from solid waste disposal are estimated using the First Order Decay (FOD) methodology in accordance with the 2006 IPCC Guidelines.

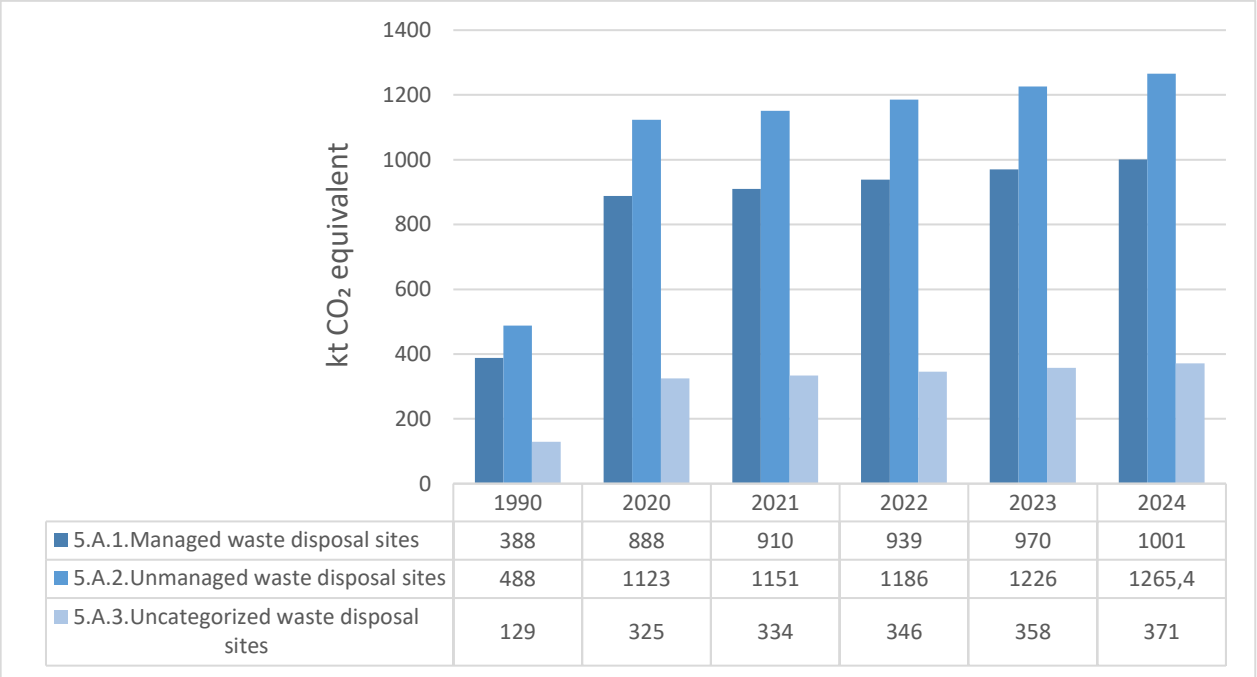
7.2.1. Landfilling of household waste and managed utilization in landfills – (5.A.1, 5.A.2)

7.2.1.1. CATEGORY DESCRIPTION (5.A.1, 5.A.2)

Since 1990 (and to some extent even before), a number of legal documents related to the domestic (household) waste management sector have been adopted and the implementation of relevant organizational measures has begun. These steps have had a strong impact on emission trends resulting from landfilling.

The sources of solid waste disposal category include municipal solid waste landfills, official and unofficial dumpsites. During the collection and disposal of industrial and municipal solid waste in cities, methane is generated due to the decomposition of waste at landfills and dumpsites. Figure 52 provides information about the emissions arising from the category of municipal solid waste.

According to the latest inventory estimates, CH4 emissions from solid waste disposal increased from 91.20 Gg in 2023 to 94.16 Gg in 2024, corresponding to an increase of approximately 3.2%. Over the period 1990–2024, emissions from this category increased by approximately 162.2%.



	1990	2020	2021	2022	2023	2024
5.A.1.Managed waste disposal sites	388	888	910	939	970	1001
5.A.2.Unmanaged waste disposal sites	488	1123	1151	1186	1226	1265,4
5.A.3.Uncategorized waste disposal sites	129	325	334	346	358	371

Figure 52. GHG emissions from solid waste disposal by site classification, kt CO_2-eq.

The utilization of waste from households and the commercial sector includes the collection of recyclable materials such as glass, paper/cardboard, metals and plastics, along with the separate collection and recycling of packaging and the mechanical and biological treatment of residual waste. Despite these measures, the growing population and demand for material consumption has led to continued increases in the generation of solid waste at the national level.

According to the activity data reported in the CRT, the total quantity of waste deposited in managed, unmanaged and uncategorised solid waste disposal sites increased from approximately 3,631.2 Gg in 2023 to 3,759.8 Gg in 2024, representing an increase of 3.5%.

7.2.1.2 METHODOLOGICAL ISSUES

Azerbaijan applies the Tier 1 approach of the 2006 IPCC Guidelines for all waste categories. Due to the lack of separate composition data for all waste categories for the years 1990-2024, the country is unable to estimate a higher level. In this sense, Azerbaijan will propose an improvement plan containing the timelines and collection of necessary activity data.

For 5.A.1 (managed waste sites), 5.A.2 (unmanaged waste sites) and 5.A.3 (uncategorized waste sites), the first-order decay (FOD) method was applied to calculate emissions from municipal and industrial solid waste disposal. The total solid waste collected at waste disposal sites are divided into unmanaged shallow, deep, uncategorized and managed anaerobic waste in line with IPCC Defaults.

Data on total national waste production by year from 2009-2024 was acquired from SSC. For years prior to 2009, the MSW timeseries was extrapolated using the relationship between total waste and population for the known period as a proxy. For industrial waste, this approach of extrapolation was applied back to 2002 only. For years previous, the alternative IPCC default approach of deriving industrial waste from national GDP has been applied. A GDP coefficient 0.03 has been applied to better reflect the economic state (and hence low industrial waste generation) in years following collapse of the Soviet Union.

Statistical bulletins were available to split total national waste into municipal solid waste (MSW) and industrial waste for the period 2020-2024. For years prior to 2020, the same split for 2020 was applied.

The composition of municipal solid waste is divided into food waste, paper and cardboard, textiles and wood types using the standard indicators of IPCC waste types.

For later years in the timeseries, it is likely that use of these default MSW composition parameters lead to an overestimate for food waste due to the separation of some food waste in Azerbaijan for incineration at the energy recovery facility since 2017. However, as no country-specific composition data is currently held for landfilled waste, no manual adjustment to the composition data has been applied. Due to the high biogenic content of food waste this issue would potentially lead to an overestimate of methane emissions in more recent inventory years (in comparison to the base year).

The fraction of MSW to solid waste disposal sites has been adjusted for the years 2013 – 2024 to account for the quantity of food waste incinerated.

Key data for 2020-2024 is presented below (Table 51). It is possible to derive an implied value for MSW generation per capita using the SSC waste and population statistics. The value for 2024 of 295.8 kg/capita/yr is lower than the IPCC regional default value for Eastern Europe (380 kg/capita/yr).

Year	Total waste (Gg)	% MSW	% Industrial	% MSW to SWDS	MSW per capita (kg/cap/yr)
2020	3,486.5	67.4	32.6	77.5	234.4
2021	3,778.2	68.3	31.7	80.6	256.4
2022	3,984.1	66.7	33.3	81.5	262.4
2023	4,086.1	66.6	33.4	80.5	267.3
2024	4,365	69.3	30.7	82.4	295.8

Table 51. Solid waste disposal activity data for category

Default IPCC model parameters, including fractions of degradable organic carbon (DOC) for all waste types, were applied based on the “Eastern Europe” climate.

7.2.1.3 UNCERTAINTIES AND TIME SERIES CONSISTENCY (5.A.1, 5.A.2)

The activity data timeseries has been reviewed and found to be largely consistent. The quantity of MSW entering the SWDS reduces in the year 2013 and onwards due to the introduction of the waste incineration facility. The visible impact of this change on the emissions timeseries is minimal due to the nature of the FOD model in that methane emissions are generated and reported across several years following deposition.

The timeseries of industrial waste generation has been adjusted for the period 1990 – 2002 to better reflect the economic situation following the fall of the Soviet Union. As a result, industrial waste activity jumps significantly following 2002. This does not have a major visible impact on the methane timeseries due to the nature of the FOD model (as above) as well as the relatively low emissions contribution of industrial waste in comparison to MSW.

Default IPCC uncertainty ranges have been considered for this category in terms of activity data and emission factors.

7.2.1.4 DESCRIPTION OF THE FLEXIBILITY APPLIED

See Flexibility Chapter 1.9.

7.2.1.5 CATEGORY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL AND INSPECTION (5.A.1,5.A.2)

Quality control and quality assurance for general and category-specific data have been carried out by relevant experts involved in accordance with the requirements of the 2006 IPCC Guidelines and related applicable documents.

7.2.1.6. CATEGORY-SPECIFIC RECALCULATIONS

The following recalculations affecting the CH_4 values by category have been applied:

• Historical waste production has been derived on the basis of new SSC data and statistical bulletins to derive the percentage of MSW and industrial wastes. Extrapolations have been updated in line with this new information and population data. The activity data time series has also been extended to incorporate the latest available information for 2023 and 2024.

• Recalculations were made due to the updating of previously incorrect MCF (methane correction factor) values in the IPCC software.

• The percentage applied in the First Order Decay (FOD) model for the ratio of municipal solid waste to solid waste disposal sites has been updated. Previously, it was set at 90% based on expert opinion. However, to better estimate the amount of municipal solid waste, this value has been adjusted to account for the portion of MSW (food waste) incinerated since 2013.

• The overall effect of these recalculations clarifies the decreases/increases in CH_4 emissions across the time series.

7.2.1.7 PLANNED IMPROVEMENTS

Due to lack of resources and data, country-specific waste composition data has not been estimated. Consultations for these values will be added to the improvement plan. Meantime, improvements such as training on IPCC methodology and advanced international practices are planned for staff of relevant institutions.

It is also planned to review the national data to ensure it is complete and understood for use in the FOD model. Further consultation may allow for improved data and/or assumptions to be made regarding the historical timeseries of MSW and industrial waste generation pre-2009.

The amount of methane recovered has not been calculated due to the lack of disaggregated data. The collection of disaggregated data for this activity will be included in the improvement plan. As part of the improvement plan, consultations are planned with waste management operators and industry representatives regarding potential ways for collecting this data.

Chapter 10 provides an improvement plan that includes timelines and an action plan with the necessary information.

7.3 Biological treatment of solid waste (5.B)

7.3.1 Category description

In Azerbaijan, the anaerobic treatment of waste for electricity production is conducted only at Balakhani landfill. Due to the very small amount of biogas produced in the process, the amount of electricity generated is relatively low.

It should be noted that, according to the 2006 IPCC Guidelines, anaerobic treatment of organic waste accelerates the natural decomposition of organic matter without oxygen by maintaining temperature, humidity and pH at optimal levels. The generated methane gas can be used for the production of heat or electricity. CO_2 emissions resulting from the combustion of biogas are of biogenic origin and are reported separately as a memo item in the Energy sector. CH_4 and N_2O emissions from biological treatment are accounted for in the Waste sector, where estimated. For now, Azerbaijan reports these emissions as not estimated (NE).

Category 5.B provides information on emissions from composting systems (5.B.1) and the digestion of biowaste in biogas facilities (5.B.2). In Azerbaijan, biodegradable waste is collected and treated separately only at Balakhani landfill. Measures are also being implemented in the cities of Ganja and Sumgayit for the regulation of activities in this area. At the moment, composting (particularly for the agricultural sector) activities are not being conducted at municipal waste landfills in Azerbaijan.

In addition to the centralized composting of separately collected bio-waste, the composting sector also includes composting conducted by residents in their own gardens (home composting). However, there are no statistical data available on this practice.

7.3.1.1 COMPOSTING FACILITIES (5.B.1)

Data on composting in Azerbaijan is not available, and considered to be a minor practice at this time. Accordingly, it is noted as “NE” in Table 5.B.1 of CRT.

7.3.1.2 DIGESTION PLANTS (5.B.2)

Data on digestion plants (5.B.2) in household waste management is not available, and considered to be a minor practice at this time. Accordingly, it was entered as “NE” in the Table of CRT (5.B.2).

7.4 Incineration and open burning of waste (CRT 4.C)

7.4.1 Category description

The construction of the waste incineration plant was carried out based on the “Comprehensive Action Plan on improving the environmental situation in the Republic of Azerbaijan for 2006-2010.” The Ministry of Economic Development held an open tender for the selection of a contractor and the winner of the tender was the French company “Constructions Industrielles de la Méditerranée S.A.” According to the contract signed on December 15, 2008, between the Ministry of Economy and “Constructions Industrielles de la Méditerranée S.A.” (CNIM” S.A.), the design, construction and operation of the municipal solid waste incineration plant in Baku were fully implemented by “CNIM S.A.”

The plant, having an annual incineration capacity of 500,000 tons of municipal solid waste and 10,000 tons of medical waste, produces up to 200 million kWh of electricity per year, which is transmitted to the general network of Baku city. The plant started operating in December 2012. On November 30, 2023, within the framework of Baku “Waste to Energy” project, Tamiz Shahar OJSC signed a purchase agreement on emission reduction with B.B Energy (ASIA) PTE LTD.

According to the latest inventory estimates, the reported quantity of waste incinerated amounted to 531.5 Gg in 2023 and 532.7 Gg in 2024. CH_4 emissions from incineration were estimated at 0.031890 Gg in 2023 and 0.031962 Gg in 2024, while N_2O emissions amounted to 0.031890 Gg and 0.031962 Gg, respectively. The total emissions from these gases amounted to 9.34 kt CO_2-eq in 2023 and 9.36 kt CO_2-eq in 2024, representing an increase of approximately 0.2%.

Simultaneously, in order to promote recycling in the country, the Balakhani Industrial Park was established by Decree No. 1947 of the President of the Republic of Azerbaijan, dated December 28, 2011. The proximity of the industrial park to the Balakhani landfill and waste incineration plant, as well as to a major transport hub, provides a favorable opportunity for raw material and energy

supply and easy access to the market for the obtained raw materials or manufactured products. The area of the park is 10.15 ha.

It is worth pointing out that the construction project of the Municipal Solid Waste Incineration Plant has been registered under the Clean Development Mechanism (CDM); however, Certified Emission Reductions (CERs) have not yet been achieved.

Open burning of solid waste is prohibited by law and is reported as not occurring in Azerbaijan. Accordingly, the notation key “NO” (Not Occurring) is used in the CRT.

7.4.2 Methodological issues

Calculations have been conducted based on the official statistical activity data from Tamiz Shahar OJSC and the SSC. For the assessment of emissions resulting from food waste incineration, the default Tier 1 approach and the emission factors and assurance program of the 2006 IPCC Guidelines have been used. Category-specific emissions of CO_2, CH_4, and N_2O have been estimated.

7.4.3 Uncertainties and time series consistency

Since the main activity data is provided by Tamiz Shahar OJSC and the SSC, the degrees of uncertainty are relatively low.

The degrees of uncertainty related to category-specific emission factors are consistent with those reported in the 2006 IPCC Guidelines, as the IPCC software with standard data was used for estimating emission.

The activity data and emission estimates for 2023 and 2024 have been incorporated using the same methodological approach, emission factors and calculation procedures applied to the preceding inventory years, thereby maintaining methodological consistency across the time series.

7.4.4 Description of the flexibility applied

See Flexibility Chapter 1.9.

7.4.5. Category-specific QA/QC and inspection

Quality control and quality assurance for general and category-specific data have been carried out by experts involved in accordance with the requirements of the IPCC guidelines and relevant documents. The preparation of a plan for sector-specific QA/QC activities will enhance the quality of the inventory in this area in the next reports.

7.4.6. Category-specific recalculations

Calculations have been made on the basis of latest national data.

7.4.7. Category-specific planned improvements

It is planned to conduct analysis on the exact nature of all waste streams currently incinerated in Azerbaijan, as only food waste is accounted for at this stage. Energy recovery has been in place since 2017, so an improvement would also be to include emissions from this category in the energy sector instead of waste. However, the exact nature of the energy recovery process is not yet understood, so emissions have been reported under waste incineration for this inventory submission.

Following TER, Azerbaijan acknowledges that emissions from the Baku waste-to-energy facility, which incinerates municipal solid waste and supplies electricity to the grid, require appropriate reporting under both the Waste and Energy sectors, in accordance with the 2006 IPCC Guidelines.

Planned improvements include appropriate allocation of emissions between categories 5.C and 1.A, avoiding omissions and double counting.

Implementation is subject to the availability of resources and availability of disaggregated data of the facility operator and relevant institutions.

7.5 Waste water treatment and discharge (CRT 4.D)

7.5.1 Category description

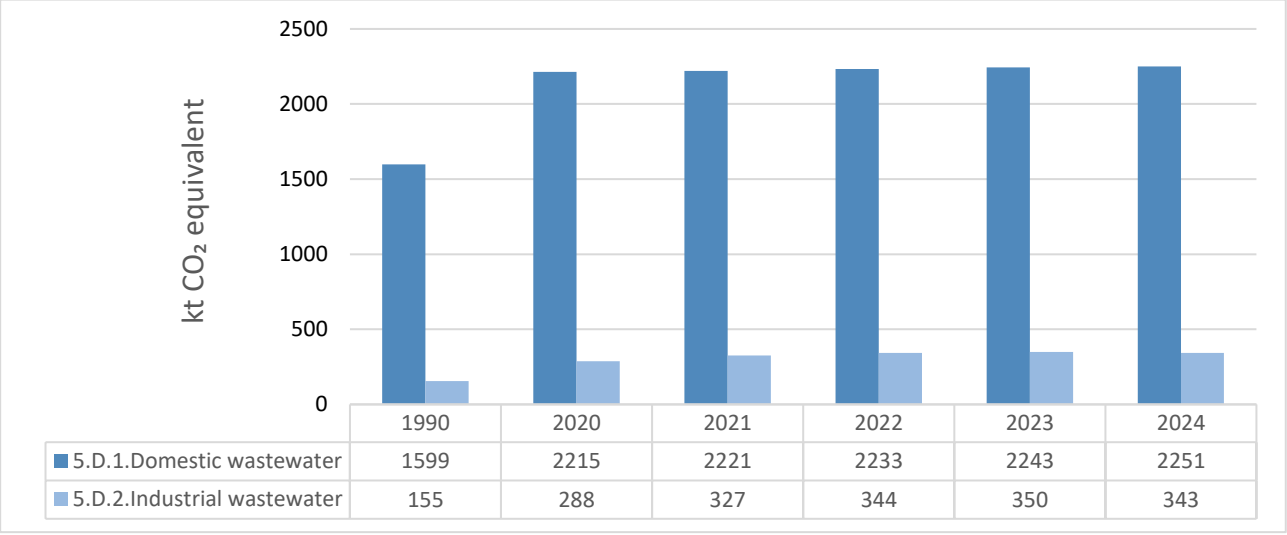
This category consists of domestic (4.D.1) and industrial (4.D.2) wastewater treatment and discharge subcategories.

Wastewater can be a source of CH_4 and N_2O emissions when treated or utilized through anaerobic methods. CO_2 emissions from wastewater are not accounted for in the IPCC Guidelines because they are of biogenic origin and shall not be included in total emissions at national level.

In Azerbaijan, over 99% of all household wastewater (based on the annual volume of wastewater) is treated through centralized wastewater treatment facilities. Generally, nearly 95% of the urban population (in terms of population ratio) is connected to such facilities through public sewage systems.

The remaining 5% of the population is served by other types of wastewater treatment systems (small wastewater treatment facilities and autonomous wells). All the mentioned forms of wastewater treatment (centralized wastewater treatment plants, small wastewater treatment facilities and wells) fall under the category of domestic wastewater treatment. Industrial and commercial wastewater (about 30% of the total wastewater), as well as rainwater, is also treated at these wastewater treatment facilities.

In 2024, total GHG emissions from wastewater treatment and discharge amounted to approximately 2,595 kt CO_2 equivalent, compared with 2,504 kt CO_2 equivalent in 2020. Domestic wastewater accounted for approximately 2,251 kt CO_2 equivalent and industrial wastewater for 343 kt CO_2 equivalent in 2024. Wastewater emissions represented approximately 3.7% of Azerbaijan's national GHG emissions in 2024. In calculating GHG emissions for this category, the Tier 1 approach of the 2006 IPCC methodology was used, based on a correlated unit factor for domestic and industrial wastewater. Figure 53 provides information on the GHG emissions generated from wastewater in the country during the reporting period.



	1990	2020	2021	2022	2023	2024
5.D.1.Domestic wastewater	1599	2215	2221	2233	2243	2251
5.D.2.Industrial wastewater	155	288	327	344	350	343

Figure 53. GHG emissions from wastewater treatment and discharge (kt CO_2-eq)

Domestic wastewater (4.D.1) is defined as wastewater generated from household water use, while industrial wastewater (4.D.2) refers to wastewater produced solely from industrial activities. Treatment and sanitation systems can vary significantly from country to country, and even within a country, systems designed for rural versus urban users, as well as for high-income versus low-income urban users, may differ. Azerbaijan State Water Resources Agency is a centralized supplier of drinking water and sanitation services to consumers in Azerbaijan. The agency provides the collection, processing, transportation and sale of water from sources and carries out waste water treatment. The agency also handles the design, construction and operation of water treatment facilities, reservoirs, pumping stations, water pipelines and sewer collectors.

The company manages 20,000 km of water supply lines and 6,000 km of sewerage and rainwater lines.

Given the above and the information in Table 6.1 of the IPCC 2006 Guidelines on "CH_4 and N_2O Emission Potentials for Wastewater and Sludge Treatment and Discharge Systems", sewer collectors are not considered a source of methane and nitrous oxide emissions as sewage collectors are closed and underground.

Sometimes, household and other waste waters are discharged from houses via special pipes into the sewage network (sewerage system), but in many settlements, the sewage pipes flow directly into rivers, streams, lakes, seas, etc.

Developing environmentally friendly treatment methods for the storage and recycling of household wastewater is an essential issue, as wastewater exposes the environment to physical, chemical and biological pollution, posing a threat to the health of living organisms.

Nitrous oxide (N_2O) in wastewater is associated with the breakdown of nitrogen components such as urea, nitrates and proteins.

Centralized wastewater treatment systems can involve a range of processes, from the discharge of nitrogen compounds into channels for their removal to modern tertiary treatment technologies. After treatment, wastewater is usually discharged into a receiving water body (e.g., river, lake, sea, etc.). Direct N_2O emissions can be generated from nitrification and denitrification of existing nitrogen. Both processes can occur both at the treatment facility and in the water body receiving the wastewater.

In Azerbaijan, next-generation (4G) environmentally friendly technology is being implemented at Hovsan Aeration Station, the largest treatment plant in the South Caucasus.

7.5.2 Methodological issues

7.5.2.1 CH_4 EMISSIONS (4.D.1)

CH_4 emissions from domestic wastewater have been calculated using the Tier 1 approach method of the 2006 IPCC Guidelines, applying the relevant emission factors and IPCC assurance program for estimating emissions from waste water treatment and discharge into all aquatic environments (biological oxygen demand - BOD). However, detailed and disaggregated activity data required to classify the effluents by the type of treatment system or water body are currently unavailable. To account for different wastewater treatment scenarios, the population has been divided into rural and urban groups. For the entire rural population, a stagnant sewer system (MCF = 0.5) has been applied as the wastewater treatment scheme. For the urban population, an anaerobic reactor (MCF = 0.8) has been chosen as the wastewater treatment model.
These coefficients are expert judgments and are considered conservative choices (such as values with relatively high MCF) that may overestimate rather than underestimate CH_4 emissions.

To account for industrial wastewater discharged into the system, a standard adjustment factor of 1.25 is applied, as recommended in page 22 of Volume 5, Chapter 6 of the 2019 IPCC Guidelines on Wastewater Treatment and Disposal.

A standard coefficient of 40 g/person/day has been applied for calculating Organically Degradable Carbon (ODC).

In the future, the country will evaluate Türkiye's standard OBT (Oxygen Biological Demand) value of 38 g/person/day as the value of a nearby comparable country, in line with Table 6.4 of the IPCC Guidelines, Volume 5, Chapter 6, Wastewater section.

7.5.2.2 N_2O EMISSIONS (4.D.1)

Azerbaijan has estimated both direct and indirect N_2O emissions from the treatment and discharge of domestic wastewater using the Tier 1 approach method and standard parameters according to the 2006 IPCC Guidelines.

The percentage of using of modern, centralized waste water treatment plants for the assessment of direct N_2O emissions is set at 75%. This value is based on expert opinion.

7.5.2.3. CH_4 EMISSIONS (4.D.2)

Azerbaijan has calculated CH_4 emissions from industrial wastewater using the Tier 1 approach and emission factors of the 2006 IPCC Guidelines. For industrial production types, activity data classified according to wastewater discharge have been applied. Industrial wastewater is discharged into centralized sewage systems.

To calculate emissions more accurately within this category, it is considered relevant to collect data on wastewater treatment and discharge depending on the type of industry.

Data from the SSC regarding the total industrial output (tons/year) of industry sectors such as alcoholic beverage production, dairy products, wine and vinegar, vegetables, fruits and juices have been used.

The total organically degradable material in industrial wastewater is estimated using industrial production, wastewater-generation coefficients (Wi) and chemical oxygen demand (COD), in accordance with Equation 6.6, Volume 5, Chapter 6, page 6.22 of the 2006 IPCC Guidelines.

For ethylene production, a wastewater-generation coefficient (Wi) of 0.1 m³/tonne has been applied. As ethylene accounts for the predominant share of the organic chemicals production covered by the national activity data, reference data for ethylene have been considered the most representative basis for this estimate. The German Federal Environment Agency's Reference Document[35] on Best Available Techniques for the Production of Basic Organic Chemicals classifies wastewater generation for the combined ethylene/propylene/acetylene category within the 0.1–1 m³/tonne product range (Table 3.2, printed p. 30; PDF p. 82). Similarly, the European Commission Joint Research Centre's Best Available Techniques Reference Document[36] for the Production of Large Volume Organic Chemicals places the lower-olefin category within the same 0.1–1 m³/tonne range (Table 2.5, printed pp. 66–67; PDF p. 105). Accordingly, the lower boundary of this range, 0.1 m³/tonne, has been selected as a proxy coefficient for ethylene production. This represents a parameter selected from published technical reference data.

The standard values for Chemical Oxygen Demand (COD) of the generated wastewater (kg COD/m³) have been applied according to the 2006 IPCC Guidelines (Table 6.9, Volume 5, Chapter 5, Wastewater). Table 6.9 does not provide COD values for the fish and sugar processing industries. Besides, the chemical oxygen demand (COD) value for vegetable oils is not given in Table 6.9. Furthermore, emissions have not been estimated due to the lack of disaggregated data. The collection of disaggregated data for this activity will be included in the improvement plan.

The amount of sludge treated (kg BOD/year) and the amount of methane produced (kg CH_4) were not estimated due to the lack of disaggregated data. The collection of disaggregated data on this activity will also be included in the improvement plan.

7.5.2.4 N_2O EMISSIONS (4.D.2)

It is mentioned that methodologies for estimating N_2O from industrial wastewater are available in the 2019 Refinement to the 2006 IPCC Guidelines; however, such methodologies have not yet been evaluated for inclusion in Azerbaijan's inventory. Therefore, N_2O emissions from this category are not estimated and the notation key "NE" has been used.

7.5.3 Uncertainties and time series consistency

Uncertainty levels of category-specific emission factors are consistent with those specified in the 2006 IPCC Guidelines. Thus, emissions have been estimated using standard data based on emission factor coefficients of the 2006 IPCC Guidelines and IPCC software.

The main sources of uncertainty include population and BOD_5 data, assumptions regarding wastewater treatment and discharge pathways, and MCF values for domestic wastewater; and industrial production, wastewater-generation coefficients, COD concentrations and treatment pathways for industrial wastewater.

[35] https://www.umweltbundesamt.de/system/files/medien/419/dokumente/bvt_organische-grundchemikalien_vv.pdf

[36] https://bureau-industrial-transformation.jrc.ec.europa.eu/sites/default/files/2019-11/JRC109279_LVOC_Bref.pdf

7.5.4 Description of the flexibility applied
See Flexibility Chapter 1.9.

7.5.5. Category-specific QA/QC and verification
General and category-specific quality control and quality assurance were carried out by experts in accordance with IPCC guidelines and requirements of relevant documents.

7.5.6. Category-specific recalculations
During the calculations, minor changes in population data were made due to verification and updates related to the use of consistent activity data.

For ethylene production, a wastewater-generation coefficient (Wi) of 0.1 m^3/tonne has been applied. As ethylene accounts for the predominant share of the organic chemicals production covered by the national activity data, reference data for ethylene have been considered the most representative basis for this estimate.

Industrial wastewater CH_4 emissions were recalculated for all available inventory years (1990 and 2020–2024), amounting to 5.539 Gg in 1990, 10.316 Gg in 2020, 11.700 Gg in 2021, 12.312 Gg in 2022, 12.527 Gg in 2023 and 12.254 Gg in 2024.

7.5.7 Category-specific planned improvements.
1. CH_4 emissions (4D1) : CH_4 emissions from sludge treatment have not been estimated due to the lack of disaggregated data on treated sludge (kg BOD/year) and the amount of methane produced or recovered. The collection of disaggregated data for this activity will be included in the improvement plan. As part of the improvement plan, it is planned to conduct consultations with waste management operators and industry representatives on potential ways for gathering this data.

2. CH_4 emissions (4D2) have been partially estimated due to the lack of disaggregated data on methane emissions from industrial wastewater treatment and discharge. Improvements to disaggregated data collection for this activity will be included in the improvement plan. Improvements to disaggregated data collection for this activity will be included in the improvement plan. As part of the improvement plan, it is planned to conduct consultations with industry representatives on possible ways to collect disaggregated data for each type of industry.

3. It is noted that there is potential inconsistency of approach in defining treatment pathway utilization between the methane and direct N_2O methodologies under category 4D1. An assumption of treatment pathway based on urban/rural split is applied for methane, whereas an assumption of 75% utilization of modern treatment plants has been applied across all inventory years for 4D2. The 75% assumption is likely to be an overestimate, however no data has been identified at this stage to properly refine the understanding of treatment pathways under the category at this stage. This item, and harmonization of the inconsistency, will be prioritized as part of the improvement plan.

4. Due to the fact that industrial effluent coefficients for the fish and sugar processing sectors are not available in the 2006 IPCC Guidelines (IPCC 2006 Table 6.9, Volume 5, Chapter 5) and also due to the lack of disaggregated data, the values shown are underestimated. The collection of disaggregated data for this activity will be included in the improvement plan. As part of the improvement plan, it is planned to conduct consultations with industry representatives on possible ways for gathering disaggregated data for each type of industry.

5. The chemical oxygen demand for plant-based (vegetable) oils is not available in the 2006 IPCC Guidelines (2006 IPCC, Table 6.9, Volume 5, Chapter 5). Due to the lack of disaggregated data, the value shown is underestimated. The collection of disaggregated data for this activity will be included in the improvement plan. As part of the improvement plan, it is planned to conduct consultations with industry representatives on possible ways for gathering disaggregated data for each type of industry.

8. Other (CRT sector 6)

Indirect greenhouse gases

According to Article 51 of the MPG, each Party shall provide information about indirect greenhouse gases, such as carbon monoxide (CO), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), and sulfur oxides (SOx).

NOx emissions occur in all combustion processes, while CO emissions arise from incomplete combustion and NMVOC emissions are generated in the oil and gas industry and during metal production processes. CF4 and C2F6 emissions come from aluminum production, sulfur oxides are emitted from cement production and other sulfur-containing chemical processes.

As mentioned, these gases, being local pollutants, also create an indirect heating effect in the atmosphere.

Since these gases are indirect GHGs, the IPCC recommends their inventory, as well. However, due to time constraints and the lack of highly qualified personnel, no inventory has been conducted in this area so far.

In the future, plans are in place to address these shortcomings and conduct assessments in this area. The inventory of indirect greenhouse gases has been included in the improvement plan for future actions.

9. Indirect Carbon Dioxide and Nitrous Oxide Emissions

According to paragraph 52 of the MPG, Parties are required to report information on indirect CO_2 and N_2O emissions.

These are indirect CO_2 emissions resulting from the use and/or evaporation of NMVOCs and CH_4, as well as indirect N_2O emissions from NOx. Apart from the evaporation of CH_4 and NMVOC, CH_4, CO and NMVOC resulting from fuel combustion, evaporative fuel emissions from vehicles and NMVOC from burning CH_4, CO and fossil fuel-derived waste are oxidized to CO_2 in the atmosphere. Meantime, NOx emissions emitted from the agriculture and LULUCF sectors are oxidized in the atmosphere, turning into N_2O.

As a developing country, Azerbaijan has not yet developed an assessment method in the GHG inventory structure that reflects the actual status of these gases and due to time constraints, the current report does not provide information on these gases. In the future, the inclusion of an inventory of these gases in the improvement plans will be discussed at the State Commission on Climate Change and Atmospheric Air Protection.

10. Recalculations and Improvements

Although the process of planning, preparation and management of GHG inventory in Azerbaijan, while not ideal, it is partially well-established. The responsibility for managing the GHG inventory rests with the State Commission on Climate Change and Atmospheric Air Protection and, in particular, MENR. However, the responsibility for calculations (accountability) and decision-making authority are assigned to relevant institutions and, in some cases, certain specialists.

(The section on recalculations and improvements is currently being reviewed and updated to reflect the methodological revisions, data updates and improvements introduced in the preparation of Azerbaijan's second Biennial Transparency Report (BTR2). The updated section, including information on recalculations, methodological improvements, revisions to activity data and emission factors, and planned inventory improvements, will be incorporated into a subsequent updated version of Azerbaijan's BTR2.)

10.1. Explanations and justifications for recalculations, including in response to the review process

As per the provisions of the MPG and the 2006 IPCC Guidelines, each country will report recalculations of the inventory time series for the initial year and all subsequent years, indicating

the relevant changes and their impact on emissions, along with explanatory information and justification for the recalculations.

This is explained by applying these new assessment methods, adding new categories for emissions and removals, updating or refining data, etc.

Periodic changes and improvements in methodology are important for improving inventory quality and reducing uncertainties. Methodological changes in the category primarily involve the transition from the previously used level to another. They typically occur when new or different data become available. An example of such a change in methodology might be the shift from the Tier 1 method to the use of a higher-tier method during inventory preparation and other improvements. On the other hand, methodological improvements occur when an inventory organization deploys the same tier to estimate emissions, but applies it using a various data source or a different collection level.

As per the IPCC methodology, the following cases are considered best practices in changing or improving methods:

- Positive changes in data availability are the most important factor in selecting an appropriate method, meaning that alterations in available data can lead to changes or improvements in methods.
- It is good practice to change or improve previously used methods when they are not transparent enough.
- Over time, staffing levels and funding for inventory preparation may rise. If it is possible to expand the amount of data required for inventory, it is crucial to enhance existing methods to achieve more accurate, complete and transparent assessments, particularly for key source categories.
- Certain data required for Agricultural and LULUCF categories (like forest inventories) may not be accessible for all years due to resource constraints. In this scenario, using interpolation between years with available data or extrapolation for years beyond the last year may be the most appropriate method.

Emissions and removals from the LULUCF sector are generally dependent on land use activities. Therefore, data should cover a wide historical period (20-100 years), and the quality of such data will change over time. In these instances, partial records, interpolation or extrapolation methods and recalculations may be necessary. Implementing Quality Assurance/Quality Control and Assessment procedures can lead to the detection of errors or inaccuracies in the inventory, which represents good practice for correcting errors in previous assessments.

All these are described in Chapters 3-7 of the current report under the “Category-specific recalculations” by sectors (energy; industrial processes and product use; agriculture; LULUCF and waste). Besides, in accordance with the MPGs, the values for the submitted inventory report are calculated based on the Global Warming Potential (GWP) values as described in the IPCC Fifth Assessment Report (AR5). In previous submissions, calculations were based on the “NAILIS” Inventory Assurance Program recommended by the UNFCCC and the GWP factors provided in the IPCC Second Assessment Report (AR2). Thus, recalculations were necessary due to changes in GWP.

The Republic of Azerbaijan, as a developing country, has decided to submit the GHG inventory reports for 1990 as the base year and for the last three reporting years (2020-2022) as part of the first BTR report, given the resource and time constraints and utilizing the flexibility provided by paragraphs 57-58 of the MPG on GHG inventory.

In subsequent BTRs, Azerbaijan will conduct recalculations of GHG inventories for other previous years and include them in its reports.

At the moment, the State Statistical Committee is collecting a lot of information necessary for the preparation of the GHG inventory. However, some data are either not collected or not in the format needed for inventory purposes.

Therefore, data collection templates will need to be modified to conform to the 2006 IPCC Guidelines, and in this sense, capacity-building of SSC staff engaged in data collection is of utmost importance. All departments involved in data collection for the SSC shall follow quality control procedures. A quality control plan shall be developed and made binding for all departments. All data used for inventory purposes shall be validated and verified. Thus, it is important to have well-trained personnel in QA/QC in each existing department.

10.2. Implications for emission and removal levels

As per the results of the inventory conducted for the current report, the total amount of GHG emissions released into the atmosphere in the last inventory year 2022 has reduced by 17.85% compared to the total emissions of the base year 1990 (including the LULUCF sector) (Table 1). Excluding the LULUCF sector, this difference amounted to 15.7%.

Various factors have influenced the levels of GHG emissions generated between the mentioned years. The effects were a result of reduced oil production, the coronavirus (COVID-19) pandemic, increased energy efficiency and the rise of alternative and renewable energy sources.

10.3 Implications for emission and removal trends, including time-series consistency

Since 2015, Azerbaijan has been conducting recalculations in its GHG inventory. A comparative analysis of the changes between the 2022 inventory, the last inventory year of the current reporting period and the 1990 report indicates that the recalculations have significantly improved the time series consistency. Specifically, due to changes in GWP, the total national emissions increased in 1990 as a result of the recalculation for 1990.

The pandemic had the greatest impact on the time series. In 2020, which was particularly affected by the pandemic, the reduction in national emissions was 18,608 kt CO_2 equivalent compared to 1990.

It should be noted that rising demand for energy and other resources due to population growth over the period since the base year has been a major determinant in the overall level of emissions.

10.4. Areas of improvement and/or capacity-building in response to the review process

Improvements are continuously implemented and incorporated into the GHG inventory development process accordingly. The key aspects of continuous improvements are outlined below:

- Review of assessment methods, activity data, emission factors and other elements.
- Holding meetings of the working group of the State Commission on Climate Change and Atmospheric Air Protection to discuss methods for estimating GHG emissions;
- Continuous improvement of assessment methods, activity data, emission factors and other elements.
- Prioritizing the implementation of issues related to the key categories and those mentioned in the previous review reports;
- Adding necessary information on methodologies, assumptions, data and other elements in the inventory report to further enhance and improve inventory transparency by investigating gaps.
- Studying the methodology for estimating indirect GHG emissions for all sectors and incorporating them in the next inventory reports;
- Enhancing the capacity of government agencies and the private sector for the widespread application of GHG inventory methodologies and making relevant amendments to national legislation to increase their authority and responsibilities.

It should be noted that the implementation of Quality Assurance, Quality Control and Assessment procedures, related to the correction of errors (revision) in the LULUCF category, has resulted in

the identification of inaccuracies in previous years' inventories, contributing to improving its quality and reducing uncertainties.

10.5. Improvements implemented and planned within the current inventory report

The planning, preparation and management process of the GHG inventory covers virtually all major areas of activity of the country. The management responsibility rests with the MENR.

In the reporting process within the UNFCCC framework there are regularly made improvements and summarizations to reduce uncertainties.

The main leading institutional organizations of the GHG inventory system are MENR and SSC. Various subordinate agencies of MENR, such as the Forest Development Service, the Biodiversity Conservation Service, the State Environmental Security Service, the State Environmental Expertise Agency and the Regional Ecology and Natural Resources Departments, serve as information sources for a number of sectors under the IPCC methodology. GHG emissions are calculated based on their data.

The SSC, another key organization, collects data from all departments, organizations and enterprises operating in all areas of activity in the country. GHG emissions are calculated using the information provided in their annual reports. By comparing the GHG emissions reported by these two organizations, uncertainties are determined and appropriate adjustments are made to improve accuracy.

In 2014, at the initiative of the MENR, a section related to GHG inventory was added to the annual official statistical report form No. “2-TG (Air)” “On atmospheric air protection” for obtaining direct data from industrial enterprises for the establishment of the MRV system regarding the GHG inventary in the country. It should be noted that the mentioned reports are entered into the electronic portal of the SSC by enterprises in agreement with MENR, which are then included in the SSC's annual reviews.

However, due to the lack of an approved unified methodological approach in this field across the country, the uncertainty level of the collected data is considered high. Besides, the lack of domestic procedures for verifying the submitted data slows down the process of establishing a sustainable GHG inventory system. Thus, improving coordination is highly needed in this respect.

10.5.1. Areas of improvement implemented within the current inventory report

In the current National Inventory Report prepared under BTR 1, GHG emission and removal sources have been extensively analyzed, with comparisons made between the 2006 IPCC Guidelines and national statistical sources. As a result, a number of improvements have been implemented within the report and a preliminary list of future improvements has been developed.

№	Sector/category	Improvements implemented
1	All sectors	The country-specific EFs of the 2006 IPCC Guidelines for all sectors have been widely used in the process of preparing the GHG inventory.
2	All sectors	For the first time in Azerbaijan, various aspects of GHG inventory were carried out in collaboration and exchange of ideas with experts from international organizations such as UNFCCC, FAO, and UNEP as part of the preparation process for the submission of the 1st BTR.
3	All sectors	Compared to previous reports to the UNFCCC, Azerbaijan for the first time has conducted an assessment of key categories for the GHG inventory, both with and without the LULUCF sector, and applied the Tier 1 approach of the 2006 IPCC Guidelines.
4	Energy	As a result of the QA/QC measures implemented for the first time in the country, the outcomes of the inventory of fuel combustion in the Energy sector for the years 1990 and 2020-2022 were compared with international source data – IEA’s calculation results.

5	Energy	The capabilities of Azerbaijan's Energy balance document were extensively utilized for the first time within the reports submitted to the UNFCCC.
6	Energy	Due to the use of new GWP values (AR5), recalculations were performed for a number of relevant categories of the Energy sector.
7	Energy	Since no activities were carried out under the CO_2 transport and storage (1.C) category, its subcategories were marked as “NO.”
8	Energy	As there are no activities under the category Other (fugitive emissions related to geothermal energy production) (1.B.2.d) in Azerbaijan, they are marked with “NO”.
9	Energy	Industrial peat production (4.II) and peat fires (4.V), which are not implemented in the country, have been marked with “NO” for the first time.
10	Energy	In the previous reports, Azerbaijan used the Global Warming Potential values from the IPCC Second Assessment Report, while the current report includes the GWP values from the IPCC Fifth Assessment Report. The recalculations show an increase in emissions, which is mainly due to the introduction of the new GWP value for methane.
11	Industrial Processes and Product Use (IPPU)	Since the processes of other uses of soda ash (2.A.4.b), other non-metallurgical magnesia production (2.A.4.c) and other limestone and dolomite uses (2.A.4.d) are not implemented in Azerbaijan, these categories are marked with “NO”.
12	Industrial Processes and Product Use (IPPU)	Due to time and resource constraints, flexibility options have been applied for gases, and emissions for substitutes of ozone-depleting substances have not been calculated.
13	Industrial Processes and Product Use (IPPU)	Since the country’s statistics did not provide data regarding the ceramics industry, the Ceramics category in the mineral industry (2.A.4.a) has not been estimated for GHG emissions, hence, is marked as “NE”.
14	Industrial Processes and Product Use (IPPU)	Emissions for the Ferroalloy category (2.C.2) have been calculated for the first time.
15	Agriculture	For the first time, the notation key “NE” was used when no data were available for emissions from sources for the application of lime to soil (3C2) and the use of uric acid (urea) (3C3).
16	Agriculture	Field burning of agriculture (crop) residues is prohibited by law. Consequently, as such activities are not carried out in the country, they have been marked with the relevant notation key (“NO”).
17	LULUCF	A value of 0.69 was used for long-term cultivated annual crops for temperate/boreal climates, in accordance with the default stock conversion factors specified in the 2006 IPCC Guidelines (Table 5.5, Chapter 5, Volume 4) for estimating carbon stocks of annual crops.
18	LULUCF	Azerbaijan has, for the first time, provided detailed information regarding land areas used in the GHG inventory for the LULUCF sector, by utilizing new data and explaining any discrepancies or inconsistencies with other national reports.
19	LULUCF	In the recalculations for the base year 1990, emissions and removals for the categories of Grasslands, Residential settlements, Wetlands and Croplands have been calculated for the first time and included in the general national inventory.
20	LULUCF	For the first time, Azerbaijan has applied the 20-year IPCC standard transition period for reporting years (i.e., for both 2022 and 2002) in the LULUCF sector.
21	LULUCF	In order to provide a complete, accurate and consistent representation of land, inconsistencies in previous reports were addressed and it was ensured that the sum of reported areas for different land categories in each year of the inventory time series equalled to the total area of the country, achieving a net change of zero for different land categories between the GHG inventory years.
22	LULUCF	Inaccuracies in past reports on Grasslands (4.C) have been partially resolved, statistical data on emissions and removals have been refined and estimated in accordance with the IPCC Guidelines.
23	LULUCF	The data and calculations for the Cropland (4.B), Residential settlements (4.E) and Other lands (4.F) categories have been reviewed, ensuring that

		emissions and removals are calculated in accordance with the IPCC Guidelines.
24	LULUCF	For the average annual increase in forests, Azerbaijan has applied a first-time assumption of 3 m^3/ha/year according to the 2006 IPCC Guidelines (Volume 4, AFOLU, Chapter 4: Forest Lands, Table 4.11B.).
25	LULUCF	Necessary measures have been taken to collect data on whether or not wood cutting (logging) activities (including legal, illegal, protective management, etc.) are considered in all forest- related activities.
26	Waste	Since no activities related to composting facilities (5.B.1) were conducted in Azerbaijan, this category has been marked as "NO."

Table 52. Improvements implemented in the current Inventory

10.5.2 Areas of improvement planned for the next years in NIR

Azerbaijan considers it essential to implement a number of improvements in the preparation of future GHG inventories to align its national GHG inventory with the MPG and 2006 IPCC Guidelines. Planned improvements for the enhancement of the GHG inventory are described in Table 53.

№	Sector	Planned improvements	Last implementation year
1	All sectors	Development of national legislation and relevant legal-normative acts on the inventory of GHG emissions.	2028
2	All sectors	Redesigning the SSC's data collection templates to align with the 2006 IPCC Guidelines (incorporating QA/QC, aspects such as gaps in activity data and their causes, uncertainties, etc.	2028
3	All sectors	Developing a comprehensive QC/QA plan that includes the organization, planning and monitoring of QC/QA measures to ensure transparent and effective oversight of the implementation of activities, in accordance with the 2006 IPCC Guidelines (Volume 1, Chapter 6) and paragraph 19 of the UNFCCC reporting guidelines (24/CP.19).	2028
5	All sectors	Conducting a national inventory of indirect greenhouse gas emissions in the country.	2029
6	All sectors	Organization of trainings for studying the IPCC and UNFCCC Guidelines on inventory of GHG emissions	Regular
7	Energy	To estimate energy emissions there will be used an improved energy balance in the preparation of the next BTR reports. This procedure will lead to significant improvements, thereby reducing the differences between intermediate (medium) and final energy data.	Every year
8	Energy	The activities required for timely access to the final energy balance will be reflected in the QA/QC action plan, and thus, the collaboration between the GHG inventory developers, the Working Group on energy balance development and the SSC will ensure the timely availability of the improved energy balance necessary for the final inventory year.	Every year
9	Energy	Implementing planned improvements to ensure statistical data collection, including analysis of carbon content values and low calorific value of fossil fuels.	Every year
10	Industrial Processes and Product Use (IPPU)	Ensuring the inclusion of activity data on clinker (based on brands) used in statistical data to reduce uncertainties following the IPCC methodology in the cement sector; collection of data on clinker production at the plant level, as well as on clinker imports and exports to ensure that emissions from clinker production are taken into account.	2027
11	Industrial Processes and Product Use (IPPU)	Conducting studies in lime production facilities and other enterprises capable of producing lime in order to split lime production statistics into high calcium lime and dolomite lime categories to improve the accuracy of emission calculation	Every year

12	Industrial Processes and Product Use (IPPU)	Collection of data disaggregated by type of glass production and on various waste factors utilized by enterprises to enable future use of the Tier 2 methodology.	2027
13	Industrial Processes and Product Use (IPPU)	Reflecting information on the amount of available statistical data of the SSC (carbonate raw materials consumed per unit of product in the production processes for the ceramics category), making improvements in their adjustment to the requirements of the 2006 IPCC Guidelines.	2028
14	Industrial Processes and Product Use (IPPU)	Investigating uncertainties related to the inclusion of intermediate products that can be converted into other chemicals or integrated into production within national statistics.	2027
15	Industrial Processes and Product Use (IPPU)	Ensuring the collection of statistical data on food and beverage production in accordance with the 2006 IPCC Guidelines	2027
16	Industrial Processes and Product Use (IPPU)	Implementing relevant measures to refine activity data for the ferroalloy sector.	2027
17	Industrial Processes and Product Use (IPPU)	Obtaining activity data that will allow for the assessment of emissions from the ODM sector in accordance with the best practices outlined in the 2006 IPCC Guidelines.	2028
18	Industrial Processes and Product Use (IPPU)	Taking measures to refine activity data for calculating emissions arising from waste management in the field of fire protection.	2028
19	Industrial Processes and Product Use (IPPU)	Ensuring the collection of data on the amount of raw materials and other materials deployed to improve the assessment of emissions for the iron and steel category.	2028
20	Industrial Processes and Product Use (IPPU)	Conducting research on the inclusion of data on primary aluminium production in national statistics.	2027
21	Agriculture	Ensuring improvements in the classification of cattle (dairy and non-dairy) as part of the improvement plan for the key category of emissions from enteric fermentation	2029
22	Agriculture	Providing activity data in accordance with the 2006 IPCC Guidelines to improve accuracy in manure management.	2028
23	Agriculture	Refining the classification of cattle (dairy and non-dairy).	2028
24	Agriculture	Improving statistical data for the classification of perennial and annual crops in agriculture according to the 2006 IPCC Guidelines.	2028
25	Agriculture	Adjusting all statistical data on category-specific activities in the Agricultural sector to the requirements of the IPCC 2006 Guidelines.	2028
26	Agriculture	Improving the statistics of organic soil and drainage activities to provide statistical data on drainage/re-irrigation activities of organic soils in the country.	2028
27	Agriculture	Building the capacity to use higher-level methods for estimating emissions and removals in the key categories of agriculture.	2028
28	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural (agrarian) universities and research centres on potential ways of gathering data on sewage sludge and plant residues applied to land as part of the improvement plan.	Regular
29	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on potential ways of gathering data on average total energy intake and average CH_4 conversion rate as part of the improvement plan.	Regular
30	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on possible ways to	Regular

		collect data on the daily emission of volatile solids and CH_4 production potential as part of the improvement plan.	
31	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on possible ways to collect data on nitrogen release from the manure management system as part of the improvement plan.	Regular
32	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on possible ways to collect the missing data on the amount of nitrogen lost due to leaching and discharge (runoff) as part of the improvement plan.	Regular
33	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on possible ways to collect data on the type and amount of organic additives used in rice cultivation as part of the improvement plan.	Regular
34	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on possible ways to collect disaggregated data on emissions from liming and other carbon-containing fertilizer activities.	Regular
35	Agriculture	Conducting analyses to accurately determine whether or not field burning of agricultural residue occurred	2027
36	Agriculture	Improving the collection of data on urea application	2027
37	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres on possible ways to collect disaggregated data regarding the amount of nitrogen lost due to leaching and runoff.	2028
38	Agriculture	Taking appropriate measures to ensure the reduction of uncertainties in methodological selection data for main animal species, enabling the country to accept a higher level for its GHG inventory according to the 2006 IPCC Guidelines.	2028
39	Agriculture	Improving national data collection for nitrate-based synthetic fertilizers in line with the 2006 IPCC Guidelines.	2028
40	Agriculture	Conducting consultations with the Ministry of Agriculture, agricultural universities and research centres to collect data on nitrogen losses from the manure management system and on the calculation of the amount of nitrogen fertilizer to be applied to agricultural lands based on those data	Regular
41	LULUCF	Collaboration with the State Service on Property Issues and the State Statistical Service to clarify the situation regarding the change of use of the rested (fallow) lands.	Regular
42	LULUCF	Conducting research on stratification of the total territory of the country according to the minimum climate, ecological zone, soil types and management regimes in accordance with the 2006 IPCC Guidelines.	Regular
43	LULUCF	Taking necessary measures to estimate emissions/removals from key categories/sub-categories/carbon sinks in the AFOLU sector using higher-level methods.	2028
44	LULUCF	Creating a database regarding changes in organic soils and drainage/re-irrigation works to determine changes in emissions/removals due to land-use changes.	2028
45	LULUCF	Providing complete, accurate and consistent information on land use, taking into account national conditions for the development of a sustainable land use classification system.	Every year
46	LULUCF	Estimating the average growing stock level of forests in Azerbaijan based on forest species, according to the general IPCC guidelines and available regional data.	2028
47	LULUCF	Studying the climate, humus, soil types and mineralization rates of soil in summer and winter grazing systems.	2028
48	LULUCF	Establishing a land use classification system for the provision of spatial data to facilitate the application of 2006 IPCC Guidelines in land management.	2028

49	LULUCF	Refining statistical data on wetlands and improving the quality of data exchange between relevant organizations.	Regular
50	LULUCF	Conducting monitoring to refine area-based carbon and nitrogen reserves in mineral soils within the land use category.	Regular
51	LULUCF	The land representation given in the current report starts from 1990. For this period, it is assumed that no land use/management changes occurred 20 years ago. Retrieving 1970 data during the next inventory period or filling data gaps using statistical methods or assumptions.	2028
52	LULUCF	Improving data in accordance with the requirements of the IPCC guidelines on GHG inventory in the AFOLU sector.	2028
53	LULUCF	Improving the uncertainty assessment of activity data and emission factors to implement uncertainty assessment of GHG inventory for the LULUCF sector in accordance with the MPG and 2006 IPCC Guidelines.	2028
54	LULUCF	Ensuring the stratification of the total territory of the country according to the minimum climate, ecological zones, soil types and management regimes in accordance with the 2006 IPCC Guidelines.	2028
55	LULUCF	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	2028
56	LULUCF	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2027
57	LULUCF	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	2028
58	LULUCF	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2028
59	LULUCF	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	2028
60	LULUCF	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2028
61	LULUCF	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	Regular
62	LULUCF	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2028
63	LULUCF	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	2028
64	Waste	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2028
65	Waste	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	2028
66	Waste	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2028
67	Waste	Conducting assessments of the average growing stock level of forests based on species in the upcoming reporting period, based on the 2006 IPCC Guidelines and available regional data.	2028
68	Waste	Considering all activities leading to logging (wood removals from forests) in the assessment of carbon stock changes.	2028

Table 53. Planned improvements

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

1.NATIONAL CONDITIONS AND INSTITUTIONAL REGULATIONS

NATIONAL CONDITIONS

1.1 GEOGRAPHICAL PROFILE

The territory of the Republic of Azerbaijan is located at the crossroads of Eastern Europe and Western Asia, bordered by the Caspian Sea to the east, Türkiye to the southwest, Russia to the north, Georgia to the northwest, Armenia to the west, and Iran to the South, namely between 38°25' - 41°55' north latitudes and 44°50' - 50°51' east longitudes. Covering an area of 86,600 square kilometers, the country possesses very diverse topography, including the Greater Caucasus Mountain range in the North, the Lesser Caucasus Mountain range in the South, and expansive central flatlands. Approximately 60% of the country is covered by mountains and 40% by lowlands and plains. The total forest coverage constitutes more than 12% of the overall area.

The total length of its borders is 3,472 km, it borders with 5 countries: in the North - with Russia (391 km) - the Main Caucasian Watershed Range, the Samur River, the Sudur Range, in the North-West - with Georgia (471 km) - Kanikh (Alazan) and Gabirri (Iori) river valleys;

In the West - with Armenia (1,007 km) - Murguz, Shahdag, Eastern Goycha, Mehri ranges, Karabakh volcanic plateau. In the South-West - with Turkiye (11 km) - Araz river; In the South - with Iran (765 km) - Talysh mountains, Araz, Astara and Bolgarchay rivers.

Pirallahi, Chilov, Boyuk Zira, Dash Zira, Khara Zira, Gil Zira, Sangi Mugan, Zanbil Islands, Baku and Absheron archipelagos, Sari and Kurdili peninsulas belong to Azerbaijan.

Azerbaijan has 825 km coastline of the Caspian Sea, where the other coastal countries are Kazakhstan, Turkmenistan, Russia and Iran. The country is located on the border of the European and Asian continents. Azerbaijani ships can enter the Atlantic Ocean through the Volga-Don and Volga-Baltic canals, and to the Arctic Ocean through the Baltic-White Sea canal. Extreme points in each of the four cardinal directions: in the

north - the Guton mountain, in the south - Astara River, in the west - Jandargol or Sadarak settlement, in the East - Oil rocks (or Shahdili cape).

The location of the country allows the country to experience a diverse range of climatic zones. The Greater Caucasus Mountain range shields the country from cold air masses from the north, resulting in milder winters in most areas. This region also receives the highest amount of precipitation in Azerbaijan, fostering lush vegetation compared to the more arid regions elsewhere. In contrast, the central flatlands, including the Kura-Araz Lowland, have a semi-arid to arid climate, characterized by hot summers and mild winters. The Caspian Sea coastline, including Baku, experiences a more temperate climate with mild, wet winters and warm, dry summers, influenced by the moderating effect of the Caspian Sea.

Having a unique geographical position, Azerbaijan has maintained its importance for world socio-economic, cultural relations since ancient period and actually it represents a country of multiculturalism, national and religious tolerance and mutual respects and coexistence

1.2 GOVERNMENT STRUCTURE

On May 28, 1918 the first parliamentary republic in the history of the Azerbaijani people - the Azerbaijan Democratic Republic was established and became a symbol of the first democratic, legal and secular state in the entire East, including the Turkic and Islamic worlds at that time. After the collapse of the USSR in 1991, Azerbaijan regained its independence on the base of the Constitutional Act on the State Independence of the Republic of Azerbaijan on October 18, 1991.

Nowadays, the executive power of the country belongs to the President of the Republic of Azerbaijan, the legislative power is been exercised by the Parliament of the Republic of Azerbaijan - Milli Majlis of the Republic of Azerbaijan, and judicial power is exercised by independent courts, where the highest instances are the Constitutional Court, the Supreme Court of the Azerbaijan Republic.

The head of state of the Republic of Azerbaijan is the President of Azerbaijan, who is elected by the people of Azerbaijan. The President of Azerbaijan appoints the vice presidents of Azerbaijan

and the first vice president of Azerbaijan, the members of the cabinet of ministries and other heads of the high-level public entities. The head of the state is the President of the Republic of Azerbaijan.

The President of the Republic of Azerbaijan is the Supreme Commander of the Armed Forces of the Republic of Azerbaijan. The President organizes the Executive Office of the President in order to ensure conditions for the implementation of the Constitutional powers and appoints its head. The President of the Republic of Azerbaijan establishes the Cabinet of Ministers for the purpose of organizing the implementation of executive powers. The Cabinet of Ministers is the supreme executive body of the President, subordinate to the President and accountable to him. The Milli Majlis of the Republic of Azerbaijan, which exercises legislative power in the Republic of Azerbaijan, consists of 125 deputies.

Deputies of the Milli Majlis of the Republic of Azerbaijan are elected by independent, personal and anonymous voting based on the majoritarian electoral system, general, equal and direct voting rights. Elections of the Milli Majlis of the Republic of Azerbaijan are held every five years on the first Sunday of November. The term of office of deputies of the Milli Majlis of the Republic of Azerbaijan is limited to the term of office of the convocation of the Milli Majlis of the Republic of Azerbaijan.

To ensure national strategic programs and projects related to the prevention of the negative effects of global and regional climate changes, as well as the inventory of GHG released into the atmosphere, monitoring of those gases, staff training in this field and fulfillment of other obligations arising from the convention, as well as to organize scientific and technical support, financial resources and the purchase of modern technologies for these purposes, the State Commission on Climate Change and Atmospheric Air Protection was established in 1997 after joining the country UNFCCC in 1994. In order to fulfill the obligations of the Republic of Azerbaijan as a party to the UN Framework Convention on Climate Change, Kyoto Protocol (2000) and Paris Agreement (2016) and other relevant international documents, as well as to achieve the goals of the INDC, a new composition of the relevant State Commission was established in early 2020, which

consists of various ministries and private sector entities and chaired by Deputy Prime Minister. Afterwards, an inclusive working group consisting of specialists, experts from all stakeholders, relevant government agencies was established to facilitate activities of the State Commission. Up today ten meetings of the State Committee were held and a number of important decisions were adopted there, such as preparation of the Climate Law, Long-Term Low-Carbon Development Strategy (LTS), National Adaptation Plan, NDCs etc. State Commission has identified the Ministry of Ecology and Natural Resources as the designated national authority and coordinating body to inform Commission on the process of implementation of the adopted decisions in a regular basis.

1.3 POPULATION PROFILE

The country has a growing population of 10.2624 million as of January 1, 2026, with approximately 54,3% of the population living in urban areas.[37] This demographic and geographic diversity poses both opportunities and challenges in addressing the effects of climate change across different regions of the country. The densest population is observed in the Absheron peninsula, and the sparsest population is in the middle and high mountain areas.

Historically, population growth in Azerbaijan was high. Thus, for the last 125 years, the population has increased more than 5 times. In the last 33 years, the population has increased more than 1.4 times. Therefore, the country has a relatively young population, with approximately 60% under age of 40. However, the growth rate has started to decrease in recent years.

Based on the final data of the last population census conducted in October, 2019, appropriate clarifications were made in the number and structure of the population for the periods after the census, as well as in some relative indicators. The population is divided into urban and rural populations according to their place of residence. Cities and settlements are considered urban areas, and other settlements are considered rural areas. Approximately 54,3% of the population primarily in

[37] The State Statistical Committee of the Republic of Azerbaijan

major cities such as Baku, Ganja, Sumgait, and Mingachevir. Baku remains the most populated city and serves as the country's economic, cultural, and administrative center with a population of more than 2,356 mln. people as of beginning of 2026.

1.4 ECONOMIC PROFILE

Having regained its independence in 1991, the Republic of Azerbaijan consolidated its efforts to create a robust national economy based on market principles and to integrate it into the global economy. Azerbaijan has been pursuing a market-oriented policy for the planned transition to a free market economy after dissolution of the soviet state. Beginning from 1994, Azerbaijan's economy began to show signs of progress as a result of historical contract - the Contract of the Century signed with reputable international oil-gas companies on 20.09.1994 and the relevant economic reforms implemented by the state in partnership with the local and international organizations, MDBs. The following years the country demonstrated political, economic stability, with steady economic growth compared to the previous years. Between 2005 and 2015, the economy of Azerbaijan had grown up dynamically. “The main directions of the strategic roadmap for the national economy and the key sectors of the economy” were approved under the Decree dated March 16, 2016, of the President of the Republic of Azerbaijan in order to ensure the sustainability of the ongoing economic policy and reforms implemented in the country. As an implementation of the Decree, the strategic roadmaps for overall national economy and 11 sectors were developed and approved by the Decree dated December 6, 2016, of the President of the Republic of Azerbaijan. The mentioned socio-economic reforms that have been successfully carried out in Azerbaijan for strengthening its financial stability, acceleration through digitalization of the socio-economic infrastructure, as well as adoption of innovative programs for inclusive development of the country. Nowadays, Azerbaijan has become a state with a stable and sustainable economy on a global scale, as well as a state, with important geopolitical and geo-economic position in the international organizations such as Non-Alignment Movement (NAM), Organization of Islamic Cooperation (OIC), Turkic States Organization (TSO) etc., playing a strategic role in ensuring global energy security with sufficient financial resources. The country makes significant contributions to international and

regional cooperation, successfully implements global projects with the initiative and participation of our country. Growing economic power and international influence made it possible for Azerbaijan to act as an initiator of large projects capable of changing the landscape of the economies of the South Caucasus and surrounding regions.

Successful socio-economic and political achievements guarantee the strengthening of Azerbaijan's economic sovereignty and its transformation into a powerful state with a high social welfare society based on modern living standards. The state of Azerbaijan has chosen the path of developing a socially oriented market economy in order to further increase the welfare of the population in the country.

After ultimate restoration of its territorial sovereignty in 2023, Azerbaijan stated the process of reintegration of liberated territories into the general economy of the country. On benefiting from the opportunity-ties of new international and regional transport-logistics corridors have given a great impetus to the development of Azerbaijan. In this framework, the formation of security, stability, prosperity and mutually beneficial cooperation in the region, as well as the development of economic and trade relations, will further strengthen the role of Azerbaijan in defining the general architecture of the regional economy.

As a positive result of the country’s economic reforms and the implementation of strategic roadmaps, Azerbaijan ranked 35th out of 137 countries in the 2017-2018 Global Competitiveness Report of the World Economic Forum. At the same time, Azerbaijan moved up by 8 positions, rising from 65th to 57th place among 190 countries in the Doing Business 2018 report prepared by the World Bank. According to this report, Azerbaijan has risen by eight points and is one of the three most reformist countries in Europe and Central Asia. Generally, the economic downturn was prevented, and stabilization was achieved as a result of the reforms implemented in the country. The signing of the Production Sharing Agreement on the development of the Azeri-Chirag-Guneshli block of oil fields in 2017, providing for the extension of the Production Sharing Agreement until 2050 was also characterized by the opening of the Baku-Tbilisi-Kars railway. In 2025 the Gross Domestic Product (GDP) increased by 1.4% and amounted to approximately 76 billion USD. The share of oil and non-oil sectors in GDP was 30.8% and 69.2%, respectively.

In order to continuously increase the level of national social welfare, the acceleration of economic growth backed by high, sustainable, inclusive and mainly private initiatives, ensuring the return of the population to the liberated territories constitute the ideological core of Azerbaijan's new development trend. For the long-term sustainable and rapid development of our country, the successful relationships of society, business and the state will be strengthened. The effective management of the state's role in the economy through market-oriented reforms, strengthening of private property institutions, business-friendly public administration and further liberalization of trade regimes in order to increase the access of local products to foreign markets will be the basic factors of economic growth. The development of private initiatives in the country on a creative and innovative basis will ensure that economic resources are directed to areas creating higher added value.

In the post-pandemic and post-conflict period, the state of Azerbaijan has entered a qualitatively new stage of strategic development, covering the years of 2022–2030. In this strategic period, Azerbaijan is able to implement new goals towards the building of a society of high welfare through new generation structural and institutional reforms, modern and sustainable sources of economic growth set in motion, further strengthening of innovation direction and financial stability of the national economy, and effective integration of the country's economy into the global value chain. It is for this purpose that "Azerbaijan 2030: National Priorities for socio-economic development" was approved and "Socio-Economic Development Strategy for 2022–2026" based on these priorities was developed. The realization of this Strategy has an essential positive impact to the country's economy, particularly economic growth, since growth rate has been accelerated especially in priority areas, and the stability of the economy and employment was strengthened.

The realization of these goals requires the formation of an effective macroeconomic policy framework that serves sustainable macroeconomic stability, the strengthening of medium and long-term "driving forces" of economic development - modernization of human

capital, expansion of digital economy, and full maintenance of economic sovereignty. The following five National Priorities for the socio-economic development of the country should be realized in this decade:

1. sustainable growing competitive economy;
2. a society based on dynamic, inclusive and social justice;
3. competitive human capital and modern innovations space;
4. great return to the liberated territories;
5. clean environment and "green growth" country.

If we zoom up the "Azerbaijan 2030: National Priorities for Socio-Economic Development", we could constate that it's a 10-year-vision, with the first 5-year-implementation program (Socio-Economic Development Strategy for 2022–2026) are focusing on expanding renewable energy, improving waste management, and increasing forest land to guide the country's decarbonization. This plan further emphasizes green energy, renewable technologies, and a high-quality ecological environment, all into the Long-term Low-Carbon Development Strategy document that was officially approved by the Cabinet of Ministries on 21 October2026. Continuation of the five-year implementation program, a draft Action Plan has been developed as an objective of the "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2027-2030", aimed at ensuring the effective realization of the targets set for the forthcoming phase.

Due to the assurance of the territorial integrity of Azerbaijan, the return of people displaced from their native land is ensured. This Great Return will be a bridge for the stable settlement of our citizens in the liberated territories and the joining of these territories to the economic activity of the country.

Considering the scale of global climate change, a significant place should be given to the application of environ-mentally friendly technologies, at the same time, the use of clean energy sources, recycling of waste and resto-ration of polluted areas should be encouraged. This will be an important contribution to the efforts towards the reduction of greenhouse gas emissions.

Together with the prospective economic development of the country, environmental enhancement, rapid resto-ration and increase of greenery, efficient use of water resources and sustainable energy sources should be ensured.

Quality and clean ecological environment in the country should be protected and efficient use of resources should be ensured. A comprehensive solution to environmental problems that have arisen over many years and sustain-able development in this field should be in focus.

Environmental risks from economic and demographic growth to the environment should be reduced in the coming years. Economic growth and the ecological environment should be balanced. Our existing resources should be restored by involving unused land plots in the country. The country's demand for quality water should be met by effective use of water resources.

In the strategic period use of alternative and renewable energy sources will increase in advanced countries. Taking this into account, energy should be used effectively in the country and new sustainable energy sources should be preferred.

In order to implement sustainable development goals aiming to meet the needs of current and future generations, the share of the "green" technologies rise each year. Based on the scientific and technical potential, the impact on climate change should be reduced by increasing the share of alternative and renewable energy sources in primary consumption in all areas of the economy, as well as increasing climate resilience of country. Moreover, environmentally friendly technologies will have a positive impact on the air quality.

1.5 ACHIEVEMENTS ON NATIONAL PRIORITIES ON SOCIO-ECONOMIC DEVELOPMENT

The national development strategies, including “Azerbaijan 2030: National Priorities for Socio-Economic Development” and the “2022-2026 Socio-Economic Development Strategy” are fully aligned with the SDGs, ensuring policy coherence across sectors.

In its vision document “Azerbaijan 2030: National Priorities for socio-economic development” the Republic of Azerbaijan has an ambitious long-term agenda for the country's 10-year socio-economic development. The main achievements of the document greatly contribute to the formation of a qualitatively new face of socio-economic development for the country's economy The main objective is to further diversify the economy and improve the model of sustainable development of the country. The “Azerbaijan 2030: National Priorities for Socio-Economic Development” reflects key priorities on building a continuously strengthening competitive economy, an inclusive society based on social justice, transforming our country into a hub of modern innovation driven by competitive human capital, and establishing a 'green growth' nation, as well as restoration and resettling liberated territories. The fifth National Priority, “A country of clean environment and green growth,” provides the overarching strategic framework for advancing environmental sustainability and strengthening national climate action. It establishes the policy basis for reducing pressures on the environment, promoting the sustainable and efficient use of natural resources, expanding green areas, facilitating the deployment of environmentally sound technologies, and enhancing the country’s resilience to the adverse impacts of climate change.

The implementation of the National Priorities is conducted in line with the main steps of the “Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026,” which reflects the first implementation stage of the Azerbaijan 2030 development agenda. The Strategy comprises the institutional, economic, social and environmental foundations necessary to ensure sustainable development through 2030. Its objectives are closely aligned with the United Nations Sustainable Development Goals and the commitments arising from the 2030 Agenda for Sustainable Development.

Within the framework of the fifth National Priority, the Strategy defines two mutually reinforcing objectives - “High-quality environmental conditions” and “Green energy space.” Implementation under these objectives encompasses climate change mitigation and adaptation, the development of national climate transparency and

reporting systems, modernization of hydrometeorological observation and early-warning infrastructure, protection and expansion of forests and green areas, and improvement of waste management systems.

Moreover, the restoration of the historical territorial integrity of the country has created the basis for the realization of the ideas of perspective development of the economy. In the last 10 years, macroeconomic stability and sustainability have been ensured in the country's economy, and economic growth supporting social welfare has been achieved.

Robust political and social stability and security in the country, visionary domestic and foreign policy played a decisive role in the achievement of complex socio-economic goals set, as well as in the restoration of territorial integrity of the country in the last 10 years. As a result of wider application of modern technologies in the leading sectors of the national economy and the attraction of quality human capital, productivity has increased significantly, the economy has rapidly diversified, and domestic production has been effectively integrated into the global value chain. As one of the active centers of the 4th Industrial Revolution, Azerbaijan has become a place of great opportunities for foreign investors. During this period, the national economy grew by 15%, and the non-oil-and-gas GDP increased by 1.4 times. In the last 10 years, the economy has successfully emerged from two global financial crises, and the country's economy has been resistant to external influences. In 2014-2015, the sharp drop in the oil price in the global commodity market and the pandemic crisis created serious challenges to the macroeconomic stability in the country. Despite all these challenges, macroeconomic stability in the country, as well as the well-being and health of the population have been preserved due to flexible economic governance, as a result the total gross national income has increased by 10 times and per capita has increased by 5 times during 2005-2025.

The Household Debt of Azerbaijan reached 15.0% in 2026, accounting for 15.0% of the country's Nominal GDP. Azerbaijan Foreign Exchange Reserves was measured at 15.1 USD bn in May 2026, compared with 14.7 USD bn in the previous month.

As a result of the fundamental structural-institutional reforms, the structure of the national economy has changed, and the share of the non-oil sector has increased significantly. In 2012-2026, the non-oil-and-gas GDP increased by an average of 3.5% annually, from 25.4 billion AZN in 2011 to 82.3 AZN in 2025, the share of non-oil-and-gas sector reached 69.2% in 2025 as compared to 48.8% in 2011. During this period, the non-oil-and-gas industry, which is the sectoral driving force of economic growth, grew by approximately 3 times.

It's remarkable that the Republic of Azerbaijan put high priority to provide humanitarian aid and development assistance to under-developed countries. Actually, Azerbaijan delivers humanitarian aid to more than 140 countries, including 53 out of 54 African countries, 50 out of 57 OIC members and 43 out of 44 least developed countries. Azerbaijan's bilateral co-operation, which is mainly implemented by the Azerbaijan International Development Agency (AIDA) and by line ministries, focuses on effective public service delivery, education, healthcare, labour and social protection, poverty reduction and youth empowerment, and humanitarian assistance. Development co-operation is delivered through grants, technical assistance and scholarships. **Azerbaijan provided USD 59.7 and USD 47.5 million (preliminary data) of the** official development assistance respectively **in 2024 and 2025**.

Azerbaijan also advances its development cooperation through active engagement in multilateral platforms such as the Organization for Islamic Cooperation (OIC), the UN Special Programme for the Economies of Central Asia, the Global Alliance against Hunger and Poverty, and the Non-Aligned Movement. Azerbaijan hosted the 29th meeting of the Conference of the Parties to the United Nations Framework on Climate Change (COP29) in Baku (2024), reflecting its commitment to climate action. Azerbaijan also actively contributes to the global development finance architecture debates, organizing a side event at the Fourth Financing Conference for Sustainable Development (2025) on strengthening the role of emerging development partners in advancing the Sustainable Development Goals (SDGs) through South-South cooperation.

The non-oil-and-gas private investments have been the main driver of private sector development. The dominance of small and medium-sized enterprises (SMEs) in the economy has increased significantly. Especially the modern economic infrastructure created at the expense of state investments has supported the development of small and medium enterprises. The number of SMEs registered during last period increased

by approximately 4 times. The loan portfolio for supporting the activity of SMEs has increased by 1.5 times since 2018 and reached up to 5 billion AZN in 2025. In order to strengthen the country's food security, local production potential and infrastructure have been improved. The indicator of self-sufficiency due to the local production of primary agricultural products based on the available land, water and climate resources is generally at an acceptable level. Along with the local production potential, the base created for the development of the warehouse infrastructure and processing industry for storing food stocks in the country is of exceptional importance in the perspective of food security. Thus, the establishment of a local processing industry and infrastructure for products that are relatively highly dependent on imports due to the lack of natural resources allows us to stably ensure the country's food security. The foreign direct investments (FDI) have played an important role in the rapid development of non-oil-and-gas sectors, especially of private initiatives. In 2011-2025, foreign direct investment in the amount of USD 17.718 billion was invested in the country's non-oil-and-gas economy. So, in 2025 the foreign direct investment in the non-oil sector increased by 6.1% compared to 2024 and reached $1,441 billion USD. Foreign investments are directed to the development of a competitive value chain in high-productivity areas and the creation of modern infrastructure. Active attraction of foreign investors was contingent upon a conducive business environment and macroeconomic stability. The state budget has been active both in supporting social welfare and providing investments for economic activity. The internal and external segments of public debt supported the goals of macroeconomic stability and budget sustainability. As of December 31, 2021, the total public debt was approximately 20% of GDP, in the meantime, as of October 1, 2026, Azerbaijan's total public debt amounted to AZN 23.896 billion ($14.06 billion) accounting for 17.3% of the country's projected gross domestic product (GDP), according to figures released by the Ministry of Finance.[38]

During the last 15 years, inflation in the country has been maintained at an acceptable level for economic activity. During this

[38] https://www.azernews.az/business/266363.html

period, the annual inflation averaged 5.3%. The stability and liquidity of all segments of the financial sector provided significant support to the financing of economic growth. The level of capitalization and liquidity in the banking sector, which is an important part of the financial sector, exceeds the norms up to 2 times. In these conditions, the share of bank assets in GDP increased from 26.8% to 44.3% since 2011, the volume of credit investments in the economy increased from AZN 9.9 billion ($5.8 billion) to AZN 17.1 billion ($10 billion).[39] The measures taken to improve the financial sector have increased confidence in the sector. Azerbaijan Total Deposit Growth was reported at 19.1 % in September 2026.[40] Azerbaijan's GDP in 2025 reached approximately 129.1 billion Azerbaijani manats (roughly $75.94 billion USD).[41]

Economic growth has improved the social welfare of all citizens. In particular, during 2018–2025, five social reform packages were implemented in the country. These reforms, covering more than 4 million citizens, required an additional annual allocation of 7.6 billion manats in total. As a result, since 2018, the minimum wage has increased 3.1 times, the average monthly wage 2 times, the total wage fund 3.2 times, the minimum pension nearly 3 times, the average monthly pension 2.6 times, annual spending on benefits and pensions 5 times, and the average amount of targeted social assistance 2.5 times. The annual funds allocated for pension payments have doubled over the past seven years, exceeding 7.2 billion manats. In addition, 10 new types of social payments have been introduced.[42] Indicators have improved in pre-school education, which is an important stage in the process of preparing quality human capital. Indicators of preschool education comprehensiveness in cities and villages have improved significantly, the specific weight of children educated in preschool educational institutions and involved in school preparation in general schools in the total number of 1–5-year-old children has increased by 16% and reached 32% in the last 5 years. In order to improve access to education in the country, an educational infrastructure based on modern technology has been created.

[39] https://ednews.net/en/share-of-banking-assets-in-azerbaijan-s-gdp-grows/

[40] https://www.ceicdata.com/en/indicator/azerbaijan/total-deposits-growth

[41] https://www.stat.gov.az/news/index.php?lang=en&id=6590

[42] https://www.sosial.gov.az/en/media/news/our-country-has-achieved-significant-social-progress-on-the-path-of-dynamic-development-rich-in-victories-8548

In 2003-2025, more than 3,600 school buildings were built or renovated, which constitutes 80.5% of all schools. The scientific research potential has been modernized, application-oriented research has been expanded, opportunities for applying modern technologies have been created, and the role of intellectual property has been increased in this process. The number of publications on research in various fields of science has increased rapidly. As a result of the institutional reform in the field of intellectual property, in the Global Competitiveness Index (GCI) in 2019, our country moved from 71st to 30th place among 140 countries on the "Protection of Intellectual Property" indicator, and the share of the creative economy in GDP increased from 3.5% to 5.3%.A clean environment has been supported in the country, along with the sustainable and efficient use of existing natural resources, the possibilities of involving renewable energy sources in turnover have been expand-ed, and new installed capacities for renewable energy sources have been determined. Modern water resources infrastructure has been created, opportunities for effective waste management have been expanded.

2. GLOBAL TRENDS, CHALLENGES AND OPPORTUNITIES IN THE COMING DECADE

In the long-term perspective, the country's economy could face new challenges generated by global and domestic factors its high-level integration into the global economy determines the sensitivity to challenges arising from the external shocks and raises needs to diversify the structure of the national economy. These challenges are multisectoral and multidirectional. In order to enter the group of high-income countries, the economy has to grow rapidly and continuously in the long term.

According to 2026 statistics, only three economies are projected to record GDP growth of more than 8%, while seven economies would grow by more than 7%. Of the 27 economies projected to record GDP growth of more than 5%, 16 are located in Africa, 8 in Asia, 2 in Europe, and 1 in South America.[43] As of September 2026, the GDP growth rate was 1.2% in Azerbaijan, where non-oil-gas sector share has increased by 2.6% in comparison with 2025.[44]

The national economy aims to be among high-income countries. For this purpose, there should be new economic growth that includes the qualities of sustainability and inclusiveness. Only such economic growth can create a foundation for a continuous increase in the income of every citizen of Azerbaijan. Rapid digitization trends in the economies of the world's countries and a significant increase in productivity, based on this, create opportunities for quality development. Continuous technological development around the world is rapidly expanding the global value chain and expanding its geography. This enables global commodities and services to be delivered to the final consumer on time, with high quality and at low cost. Consumers of the digital society have an opportunity to track the products they order along the entire value chain. Taking advantage of these trends will support the integration of the country's economy into the global value chain in the short term.

[43] https://statisticstimes.com/economy/countries-by-projected-gdp-growth.php

[44] https://www.stat.gov.az/news/macroeconomy.php?lang=en&page=1

Climate agenda of the country, particularly its development priorities require a remarkable increase in use of renewable energy sources and the use of environmentally friendly, energy efficient technologies. In order to provide inclusive economic growth, inequality trend of development between rural and urban should be neutralized. Thus, a**fter the liberation of the territories in Garabakh and Eastern Zangezur regions of Azerbaijan from the Armenian occupation in 2020, Azerbaijan decided to rebuild settlements on the basis of the concept entitled "smart city" and "smart village" in four economic centers, which will provide development of various sectors of the economy, including industry.**

In rural areas, as well as in cities educational institutions, medical institutions, cultural centers, important utility and development services, which are important elements of modern socio-economic infrastructure, are created on the basis of digital technologies. All these activities will significantly reduce the difference in living standards between urban and rural areas. During rural planning and population settlement, the region's current and potential role in the economic value chain is taken into account. Acceleration of globalization processes and increase in the frequency of financial crises increase attention to ensuring macroeconomic and financial stability. Macroeconomic stability is the main condition for sustainable economic growth in the long term. Low and stable inflation, a sustainable exchange rate, as well as the stability of all segments of the financial sector determine domestic and foreign investment activity. Competition for attracting global direct investment is intensifying. These investments require the existence of a healthy and transparent business environment, macroeconomic stability and financial stability. In the absence of the mentioned conditions, the flow of foreign direct investments that bring high technology and knowledge to the country may be hindered. Experience shows that foreign direct investment, which is the main driver of rapid development, can create high-quality human capital, along with sustainable new jobs in the country.

The effective reintegration of the liberated territories of Azerbaijan into the socio-economic system is being ensured together with climate change activities to turn the Eastern Zangezur and Karabakh region into the “net-zero zone” in Azerbaijan. For this purpose, the relevant reconstruction works are being carried out in these territories in a phased manner, with prioritization decarbonization, green energy activities based on modern

experience, to create modern social and business infrastructure with the wide application of digital technologies, and to ensure sustainable settlement of the population based on this. The mentioned works are being implemented within the framework of international cooperation based on modern experience and approaches. Full utilization of the existing economic potential of the liberated territories, especially regional transport and communication projects to be implemented through the Zangazur corridor, creates broad opportunities for continuous and sustainable development.

Concerning overall climate change activities of the country, the Republic of Azerbaijan continues to strengthen the institutional, technical and methodological framework for the inventory, monitoring and reporting of greenhouse gas emissions in accordance with the requirements of the Paris Agreement and its Enhanced Transparency Framework (ETF). Sector-specific data collection mechanisms have been developed in accordance with the applicable IPCC methodologies, institutional arrangements for the preparation of the national greenhouse gas inventory have been further enhanced, and the technical architecture of the national Monitoring, Reporting and Verification (MRV) system has been established.

As part of these efforts, the national MRV system has been launched in pilot mode through the Climate Transparency Platform. The Platform integrates dedicated modules for the management of the national greenhouse gas inventory, tracking progress towards the implementation of the Nationally Determined Contribution, monitoring climate finance, and supporting climate-related reporting. Its pilot operation and functional enhancement have continued through the development of electronic mechanisms for data entry, verification, updating and management, as well as the testing and refinement of data flows and user functionalities.

In parallel, efforts to further strengthen the legal and institutional framework for climate governance have continued through the preparation of the draft Law of the Republic of Azerbaijan “On Climate.” An inter-agency working group has been established to facilitate the further refinement and coordination of the draft legislation.

Azerbaijan has continued to advance its climate change mitigation agenda through the progressive enhancement of its Nationally Determined Contributions and the development of a comprehensive long-term low-carbon development framework.

The country's updated Third Nationally Determined Contribution (NDC3.0) was prepared and submitted to the Secretariat of the United Nations Framework Convention on Climate Change in the context of COP30.

In parallel, the Long-Term Low-Carbon Development Strategy (LTS) was adopted on 21.10.2026 by the Cabinet of Ministers of the Republic of Azerbaijan on 21.10.2026.

Taken together, the NDCs and LTS processes provide an increasingly coherent framework for aligning Azerbaijan's medium-term climate commitments with its long-term socio-economic development priorities and for progressively mainstreaming decarbonization considerations across national development planning and sectoral policymaking.

Climate change adaptation constitutes an integral pillar of Azerbaijan's national climate policy. In this context, climate-related risks and the current and projected impacts of climate change have been assessed across vulnerable sectors, and the National Adaptation Plan (NAP) has been prepared and submitted to the UNFCCC Secretariat.

To facilitate the transition from strategic planning to implementation, a preliminary implementation plan for the NAP has been developed. These efforts contribute to the establishment of a more systematic and coordinated national adaptation framework based on climate-risk and vulnerability assessments, strengthened institutional coordination, and the progressive mainstreaming of climate resilience considerations into national and sectoral development planning.

The continued modernization and expansion of hydrometeorological observation and early-warning systems constitute an important component of Azerbaijan's efforts to strengthen climate resilience and improve preparedness for climate-related hazards.

The national observation infrastructure has been upgraded through the installation of automatic meteorological, hydrological and marine observation stations, Doppler meteorological radars and radiosonde systems.

The national observation network currently comprises 69 automatic meteorological stations, 6 automatic marine stations, 40 automatic hydrological stations, 3 Doppler meteorological radars and 2 radiosonde systems. The expansion and modernization of this infrastructure have enhanced the continuity, accuracy and operational availability of observations and strengthened national capacities for forecasting hazardous hydrometeorological events and issuing timely early warnings.

The protection, restoration and sustainable management of forests, together with afforestation and the expansion of green areas, constitute important components of

Azerbaijan's environmental and climate policy and contribute to the conservation and enhancement of natural carbon sinks.

These measures contribute to enhancing ecosystem resilience, maintaining and increasing carbon sequestration capacity, reducing land degradation risks and supporting the achievement of the country's broader environmental and climate objectives.

The modernization of waste management constitutes an important component of Azerbaijan's transition towards a cleaner, more resource-efficient and lower-emission development model.

Measures have been implemented to further strengthen the regulatory, institutional and technological framework governing waste management, while particular emphasis has been placed on the digitalization of waste tracking and control throughout the waste management chain, from generation and collection to treatment and final disposal.

By the Presidential Decree dated 10 January 2025, the Digital Ecology Information System (REIS) and its Regulations were approved. Within the framework of REIS, the development and testing of the "State Control over Waste Management" subsystem have been completed, providing the technical basis for the centralized digital management and oversight of waste flows.

Infrastructure for the treatment of hazardous waste has also been strengthened, while initiatives promoting zero-waste approaches, separate collection, recycling and reuse have been advanced. In parallel, work has commenced on the preparation of a national strategy for improving municipal solid waste management for 2027-2030.

Collectively, these measures are expected to enhance the traceability and transparency of waste flows, increase resource recovery, improve the effectiveness of waste management and support the progressive transition towards circular economy principles.

The environmental restoration and climate-resilient development of the territories liberated from occupation constitute an integral component of Azerbaijan's broader sustainable development and climate agenda and are being pursued within the framework of the First State Programme on the Great Return to the Territories Liberated from Occupation of the Republic of Azerbaijan.

Measures implemented in these territories encompass the restoration of forests and expansion of green areas, development of modern waste management infrastructure, restoration and modernization of hydrometeorological observation systems, and strengthening of early-warning capacities.

Implementation of the Azerbaijan-Türkiye International Forestry Training Centre, Smart Nursery Complex and Friendship Forest projects has continued. Furthermore, remote-sensing-based forest inventory activities have been completed across 56,952.2 hectares of State Forest Fund land, contributing to the establishment of an improved evidence base for the sustainable management and restoration of forest resources in the liberated territories.

As part of the restoration and modernization of hydrometeorological services, 11 automatic hydrological stations on 10 rivers and 5 automatic meteorological stations have been installed, with observation data transmitted to the central server for processing and analysis. Additional automatic agrometeorological and meteorological stations have subsequently been commissioned.

The integration of environmental restoration, resource efficiency, climate-resilient infrastructure and modern environmental monitoring systems into the reconstruction process contributes to embedding green, low-carbon and climate-resilient development principles into the long-term development of the liberated territories.

The implementation of Azerbaijan's climate and green development agenda is supported by a comprehensive and evolving framework of national strategies, State Programmes, action plans and sector-specific policy instruments. These instruments complement "Azerbaijan 2030: National Priorities for Socio-Economic Development" and the "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026" and facilitate the systematic integration of environmental sustainability, climate change mitigation and adaptation, resource efficiency and resilience considerations into national, sectoral and regional development planning.

Key strategic and sectoral policy documents adopted and under implementation during the reporting period include:

- "Azerbaijan 2030: National Priorities for Socio-Economic Development";
- "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026";
- "First State Programme on the Great Return to the Territories Liberated from Occupation of the Republic of Azerbaijan";
- Action Plan for 2024-2027 for the implementation of the "National Strategy on the Efficient Use of Water Resources";
- "State Programme on the Socio-Economic Development of the Nakhchivan Autonomous Republic for 2023-2027" and its Detailed Action Plan for 2025-2027;
- "National Action Plan on Gender Equality (Equality of Women and Men) in the Republic of Azerbaijan for 2026-2028" and its Action Plan;

- "State Programme on the Development of Agricultural, Fisheries and Aquaculture Production and Processing Sectors in the Republic of Azerbaijan for 2026-2030" and its Action Plan;
- Action Plan for the implementation of the "State Programme on the Improvement of Transport Infrastructure in Baku City and Surrounding Areas for 2025-2030";
- Action Plan for the implementation of the "State Programme on the Improvement of Water Supply, Stormwater and Wastewater Systems in Baku City and the Absheron Peninsula for 2026-2035".

Collectively, these strategic and sectoral policy instruments provide an integrated framework for mainstreaming climate considerations into national, sectoral and regional development planning. They support sustainable resource management, climate-resilient development and ecosystem resilience, while contributing to the implementation of Azerbaijan's climate commitments and alignment with the objectives of the Paris Agreement and the 2030 Agenda for Sustainable Development.

3. CLIMATE PROFILE

The Republic of Azerbaijan is located in the area of temperate and subtropical climate zones intersection. Climate-forming factors include solar radiation and atmospheric circulation. Along with these, geographical latitude, relief features, sea and ocean currents, and other factors also have a great influence on climate formation and determine the distribution of the elements of the climate zone such as temperature, humidity, wind, etc. Most of the territory of Azerbaijan is located in the subtropical climate zone, only the northeast of the Greater Caucasus mountains is in the temperate climate zone.

The Greater Caucasus mountains block cold air masses coming from the north, and the Lesser Caucasus mountains block warm dry tropical air flows coming from the south, weakening their effect. The Caspian Sea has a moderating effect on the climate. The average annual temperature in the Kura-Araz area is 14.5°C, and is below 0°C in the highlands.

The absolute maximum temperature in Nakhchivan (Julfa) is +46°C, and the absolute minimum temperature in Nakhchivan (Julfa) is −32°C. The annual temperature amplitude in Nakhchivan is more than 60°C (sharp continental climate type). In the Kura-Araz and Lankaran lowlands, in Absheron, the average annual temperature is +14.5°C, so it is possible to plant heat-loving plants here and harvest twice a year. However, artificial irrigation is needed since precipitation in these areas falls in the cold period of the year. Atmospheric precipitation in the Republic of Azerbaijan is mainly due to the intrusion of air masses into the territory. The amount, season and annual distribution of precipitation are determined by the terrain relief and the interaction of air masses with the Caspian Sea. The lowest average annual precipitation in Azerbaijan (less than 150–200 mm) falls on the southeastern Gobustan and the southern coast of the Absheron peninsula.

Annual precipitation in the central and eastern parts of the Kura-Araz lowland, the southeastern part of the Samur-Davachi lowland, the Araz region of the Nakhchivan Autonomous Republic, Gobustan and the main parts of the Absheron peninsula, is less than 300 mm. Their amount gradually increases from the Caspian Sea coast to the west, from the plains to the mountains.

In the mountains, precipitation increases up to a certain height (2600–2800 m in the Greater and Lesser Caucasus, 2600–3000 m in the Nakhchivan Autonomous Republic, up to 200–600 m in the Talysh), and then gradually decreases. Maximum annual precipitation in these areas is 1,400–1,600 mm on the southern slope of the Greater Caucasus, 800 mm on the northeastern slope, 800–900 mm in the Lesser Caucasus and Nakhchivan Autonomous Republic, and 1,700–1,800 mm in the Talysh mountains.

Unlike other mountainous areas of the Republic, the amount of precipitation in the Talysh mountains decreases with increasing altitude, and in the high mountainous part (above 2000 m) and in the intermountain valleys its amount is less than 250–300 mm. Despite the fact that the major part of precipitation falls on the warm period of the year (April-October), the summer months are dry, and even in the Lankaran-Astara zone, which is characterized by abundant precipitation, the amount of precipitation is 5–15% of the annual norm.

In this regard, over the past 23 years, the average temperature increase across the country has reached 1.1°C. In 2023, the average temperature rose to 14.6°C, which is 1.9°C higher than the norm. The highest average temperature in recent decades was recorded in 2010, reaching 14.8°C. The mentioned temperature rise trend causes various direct and indirect negative impacts such as heat waves, water scarcity, land degradation, desertification, wild-fires, level decline in the Caspian Sea and other climate-related natural hazards. For instance, the number of heatwave days in Baku has increased from 86 days in the 1960-1990 period to 365 days in 1991-2020.[45] Urban areas such as Baku experience even more pronounced effects due to the urban heat island effect, where urban areas have significantly higher temperatures than their surrounding rural areas because of the intensity of the socio-economic and human activities in the city (e.g., infrastructural elements like pavements). Moreover, the water resources of the country are under significant stress due to the global warming. The uneven distribution of water resources, combined with increased evaporation rates and river flows, has reduced Azerbaijan's water resources by approximately 15% over recent decades. Furthermore, precipitation in the country as a whole decreased by about 3.4% over the last 10 years, compared to the climatic normal of 1971-2000, further contributing to water stress. The mentioned climate trend exacerbates water scarcity, particularly critical for population and its economic activities, including such sectors as agriculture, urban development, LULUCF, which relies heavily on irrigation. Apart that, the Caspian Sea is actually experiencing a serious level change. Recent studies have shown a continued decline, with an average drop of more than two meters in the last 30 years mainly due to decreased water in inflowing rivers, mainly Volga because of the increased evaporation due to rising temperature and economic activities in the mentioned river basin. Such decline poses substantial risks to coastal infrastructure and overall ecosystems. Since according to the relevant scientific assessments, even small changes in sea level could lead to the gradual loss of coastal wetlands, biodiversity degradation, as well as reduce actual marine transport and oil-gas exploitation activities in the Caspian Sea and exacerbate other socio-economic and political risks in the basin.[46]

3.1 CLIMATE CHANGE AND GREEN DEVELOPMENT

Inclusion of the item "Clean environment and "green growth" country" into the list of national priorities demonstrates the country's desire

[45] Azerbaijan's Fourth National Communication to the UNFCCC

[46] Environmental risks related to the water level decline in the Caspian Sea | Academic Journals and Conferences

to contribute to the implementation of Paris Agreement commitments and to mitigating the effects of climate change in general.

The "Socio-economic Development Strategy of the Republic of Azerbaijan for 2022-2026", developed based on these priorities, envisages ensuring sustainable use of natural resources, promoting environmentally friendly industrialization, developing an effective waste management system for this purpose, protecting biodiversity, increasing water bioresources and developing aquaculture, as well as strengthening the protection of forested areas and greenery. As a result, the share of greenery in the total area of the country will be increased from 12% to 12.3% by 2026. The share of unusable land will decrease from 25% to 15%. The population's drinking water supply will increase from 70% to 85%, and irrigation water supply – from 80% to 90%. The coverage of the waste recycling process will be 20% (10% in the regions). The ratio of total area of the specially protected natural territories network to the total land fund of the country will be 10.5%. 65% of the forest fund will be inventoried. Agrochemical analyzes will be provided on 30% of the lands.

The regulatory environment in the energy sector will be improved and liberal market principles will be applied. Use of renewable energy sources will be increased, energy efficiency will be ensured. The use of environmentally friendly vehicles and other green technologies will be expanded to combat climate change. As a result, the financial burden of the state in the energy sector will be reduced and subsidies will be phased out. The share of renew-able energy sources in the installed capacity of electricity generation will be increased to 24% by 2026 (in accordance with the target of 30% by 2030). Azerbaijan has tremendous renewable energy potential. The technical potential of renewable energy resources is estimated at 135 GW onshore and 157 GW offshore. The technical potential by source is assessed at 15 GW for wind energy, 115 GW for solar energy, and 5 GW for hydropower. The economic potential is estimated at 27 GW onshore, including 3 GW for wind energy and 23 GW for solar energy, while the bioenergy potential is assessed at 380 MW and the potential of mountain rivers at 520 MW. The economic potential of the offshore areas is currently under assessment. Law No. 339-VIQ of the Republic of Azerbaijan "On the Use of Renewable Energy in the Production of Electricity" dated May 31, 2021, has been adopted to develop the renewable energy sector in the country and improve the legislative and institutional environment in this field.

The afore-mentioned "Socio-economic Development Strategy of the Republic of Azerbaijan for 2022-2026" document specifically indicates a number of areas of activity consistent with the Paris Agreement, including the expansion of the use of green technologies to combat climate change. These areas of activity include the following:

- Inventory of greenhouse gases and development of a Monitoring-measurement, Reporting and Verification

(MRV) system

- Creation of a National Database on Climate Change
- Development of "State Program on Low-Carbon Development"
- Development of National Adaptation Plan for sectors more vulnerable to the impacts of climate change
- Development of National Plan on Electromobility
- Stimulation of circulation of environmentally friendly and safe vehicles (cars, buses, etc.) and creation of necessary infrastructure
- Studying the potential in the field of hydrogen production and use, and formulation of proposals for pilot projects in this field
- Research on the application of energy storage systems and making proposals
- Research on the application of carbon capture, utilization and storage (CCUS) technologies in the energy sector and making proposals.

The action plan of this Strategy also includes energy efficiency, obtaining energy from waste, increasing green areas, and expanding the use of renewable energy sources.

The Republic of Azerbaijan, as a developing country, recognizes that climate change is a potential threat to all humanity, that neither developed nor developing countries are immune from climate change, and considering it important to take measures to prevent this global threat, has implemented a number of important measures in this direction. In this regard, it is of utmost importance to define how the two critical elements of the PA - Nationally Determined Contributions (NDCs) and Long-Term Low-Carbon Development Strategies (LTS) - are interconnected, and to effectively allocate resources to develop measures aimed at reducing (mitigation) impacts on the climate system.

The INDC (2016) targets a 35% reduction in GHG emissions by 2030 compared to 1990, NDC2 (2023) had a conditional target of 40% emissions reduction by 2050 compared to 1990. NDC3 which was submitted in 2025 during COP30, has more ambitious but conditional target of emissions reduction compared to the base year, namely 40% reduction even by 2035.

For the purpose of ensuring the implementation of the Order of the President of the Republic of Azerbaijan dated May 3, 2021, the "Action Plan for the Creation of a "Green Energy" Zone in the Liberated Territories of the Republic of Azerbaijan in 2022-2026" was approved by the order of the Cabinet of Ministers, and the Ministry of Energy of the Republic of Azerbaijan was entrusted with the coordination function over this Action Plan. In addition, a "Carbon Neutrality Concept for the Liberated Territories" document was developed with the involvement of an international consulting company.

Green agenda of the country is being supported by the Heydar Aliyev Foundation as well, which has been playing a pivotal role in advancing Azerbaijan's social, cultural, and environmental agenda. The Foundation, which was established in 1994, promotes sustainable development and supporting initiatives that align with Azerbaijan's national priorities, including environmental preservation and climate resilience. As part of its mission, the Heydar Aliyev Foundation has championed several initiatives aimed at fostering environmental awareness and promoting sustainable development across Azerbaijan, has taken an active role in high level organization of COP29 in Baku, 2024. These efforts are closely aligned with Azerbaijan's commitments under the United Nations Framework Convention on Climate Change (UNFCCC), as well as the country's LTS and Nationally Determined Contributions (NDCs).

3.2 THE DYNAMICS OF GHG EMISSIONS AND ABSORPTIONS

After ratifying the UN Framework Convention on Climate Change (UNFCCC) on 10.01.1995 (parliament decision № 948), one of Azerbaijan's

initial steps was to prepare an inventory report on GHG emissions, monitor the dynamics of these emissions, and study the reasons for their changes.

The inventory process of GHG emissions in the Republic of Azerbaijan effectively began in 1998, with the preparation of the First National Communication for the period 1998-2000. To date, the country has developed four National Communication documents and two Biennial Updated Reports.

Analyses indicate that the dynamics of GHG emissions in Azerbaijan since 1990 have been directly linked to nation-al conditions and changes in various elements of the economy and environment. Since 1990, Azerbaijan has undergone a range of extensive economic and environmental changes.

Although progress has been made in some fields related to GHG emissions (such as enhancing energy efficiency and improving land management practices), certain challenges still persist in sectors like the oil and gas industry, transportation, and waste management.

Despite the implementation of the certain number of strategic projects aiming green development in the country, dependence on oil and gas continues to shape the country's overall emissions profile. The main reason of such dependence could be explained with the facts that Azerbaijan had to be well prepared to stop the 30-years occupation of the country by neighboring state and restore its territorial sovereignty, another fact is ongoing energy shocks fluctuations in the global energy market due to the geopolitical confrontation in the Middle East and Russia-Ukraine war.

Under the leadership of National Leader Heydar Aliyev, one of the landmark agreements in Azerbaijan's 20th-century history due to its political, economic and strategic importance - the Agreement on the Joint Development and Production Sharing for the “Azeri” and “Chirag” Fields and the “Gunashli” Field in the Azerbaijani Sector of the Caspian Sea - "The Contract of the Century" was signed on 20 September 1994. Under the Decree signed by President of the Republic of Azerbaijan Heydar Aliyev on 29 December 1999, the State Oil Fund of the Republic of Azerbaijan was established to ensure effective management of hydrocarbon revenues and fair distribution of oil among generations and to channel oil revenues into the development of priority areas. On 14 September 2017, the amended and restated Azeri-Chirag-Gunashli Joint Development and Production Sharing Agreement (Contract of the New Century) was signed in Baku. That marked a new stage in the development of the “Azeri-Chirag-Gunashli” field. The new agreement was signed by

officials of the Azerbaijani government, SOCAR, bp, Chevron, IMPEX, Statoil, ExxonMobil, TP, ITOCHU and ONGC Videsh companies. By the way, bp remained the project's operator under the amended and stated agreement, which was extended until 2049.Over the past period, Azerbaijan has become not only a supplier but also a reliable transit country. Caspian littoral countries prefer to transport their hydrocarbon resources to international markets through Azerbaijan, as well as oil extracted from the Caspian Sea sector to global markets via Baku-Tbilisi-Ceyhan route. Azerbaijan also has the largest fleet in the Caspian Sea.

Actually, Azerbaijan's proven natural gas reserves total 2.6 trillion cubic meters, with projected reserves of about 3 trillion cubic meters. This ensures that the country will remain a reliable supplier of hydrocarbon resources for the next 100 years. One of the world's largest gas fields - "Shah Deniz", was discovered by Azerbaijani geologists in the middle of the last century. However, due to the unavailability of the necessary technology, the exploitation of the field was halted, and its potential was not identified. On 29 October 2013, President of the Republic of Azerbaijan Ilham Aliyev signed an Order to establish a State Commission to protect Azerbaijan's interests in the Southern Gas Corridor project and provide state support to the project participants. In the same year, the Shah Deniz consortium chose the TAP (Trans Adriatic Pipeline) project in 2013, which links the Türkiye's border to the south of Italy to deliver the Azerbaijani gas to the European markets, the construction of the pipeline was completed in 2020. Transportation of commercial natural gas has started on 31 December 2020 via the TAP pipeline, which transports Azerbaijani natural gas to Europe. Thus, Azerbaijan's rich gas reserves are delivered to the Turkish and European markets in diversified, short, and secure ways. In June 2025, the partners of the Shah Deniz Consortium adopted the Final Investment Decision on the Shah Deniz Compression project. The project is expected to enable the production of approximately 50 billion cubic meters of additional gas and about 25 million barrels of additional condensate from the field.

On the other hand, population growth, which is one of the remarkable elements of the national circumstance, is among the key factors determining the trends of GHG emissions in the country. Thus, in 1990, the population was 7.1 million, while by 2025, the last inventory year of the reporting period, this figure had risen to 10.262 million by 2026.[47] Naturally, the increase of the population by approximately 50% during the last 30 years has correspondingly raised the demand for energy resources. Besides, the growing population's demand for new jobs, food products, industrial and house-hold goods, as well as housing and transportation, has been one of the

[47] https://www.stat.gov.az/source/demoqraphy/ap/?lang=en

main reasons for the increase in GHG emissions in the country during this period.

GHG emissions in Azerbaijan began to decline sharply starting in 1991. This decrease continued until 1998, when it reached its minimum level in that year, with a reduction of 45%. The decline was primarily attributed to the difficulties in the country's economic situation. Thus, the sudden disruption of historically established economic ties among countries within the Soviet Union, stagnation in production, and the deepening of inflationary processes caused a sharp recession and led to a significant reduction in emissions.

The recession trend was particularly severe in the industry, resulting in the closure of many industrial sectors. 24 machine-building factories operating in the country, petrochemical enterprises in the city of Sumgayit, a large glass factory in Baku, and other facilities completely halted their operations.

In addition, the outbreak of war due to Armenia's aggression, the occupation of 20% of the territory, and the displacement of nearly one million people as refugees and internally displaced persons (IDPs) further exacerbated the situation. It is evident that the primary reasons for the sharp decline in GHG emissions in 1990-1998 were the disruption of economic cooperation ties resulting from the collapse of the Soviet Union and certainly the aggression of Armenia that was ended in 2023. Despite the population growth in the country during said period, the quantity of emissions decreased.

The industry and construction category of the energy sector began to reduce its operations during the economic recession, i.e., in the 90s. Enterprises within this category eventually came to a complete halt. By the end of the 1990s, emissions in this category had decreased by 80%.

The "Contract of the Century," signed in 1994, breathed new life into the revival of the country. The recovery that began in the oil and gas industry spurred growth in other sectors as well. However, as Azerbaijan's economy rebounded in the 2000s due to increased oil and gas exports, emissions began to rise again, particularly in sectors like transportation and waste management.

In this report, the trends and dynamics of key categories from the base year 1990 to the most recent reporting year 2022 have been evaluated in line with time series.

After the situation improved in the country, the increased attention to the environmental situation facilitated the reduction of GHG emissions in this category. Several ecological projects were implemented during that time. Among them, the largest projects were the accumulation of associated gas from the "Gunashli" and "Oil Rocks" fields, implementation of which enabled the annual gas accumulation by appr. 530 mln m^3.

TPPs basically used liquid fuel oil such as mazut, while heating centers mainly relied on gas and, in exceptional cases, mazut. Starting in 2012, the country switched from mazut to gas, and as a result, there was a reduction of 8 million metric tons of CO_2 emissions annually. Already in 2022, the use of mazut dropped to 3%. However, the increase in population and industrial sectors has, in turn, raised the demand for electricity, which is one of the major factors contributing to the increase in emissions at present.

In the transportation category, emissions from aviation, road transport, and railways increased in 2022 compared to 1990. However, emissions from maritime (waterborne) transport decreased. This can be attributed to the fact that most ships in maritime transport have switched from using mazut fuel to diesel fuel.

Most of the GHG emissions in the other sectors, such as the commercial/institutional, population, and fishing industry categories, were lower than the base year. However, emissions in the population category have increased by about 57% compared to the base year. This is explained by the higher energy demand due to population growth and the improvement of their living conditions.

In the key category of industrial processes and product use sector, emissions substantially increased during the reporting period due to the rising utilization of mineral raw materials. Nevertheless, the transition of cement plants from the wet method to the dry method, namely, the implementation of new technologies, has helped to prevent further increases in emissions.

The increase in livestock during the post-Soviet period in Azerbaijan indicates a focus on agriculture, as categories such as enteric fermentation and manure management have significant emissions. One of the main reasons for the increase in agricultural emissions has been the growing demand for food products due to population growth. However, the results of the GHG inventory conducted within the framework of the current report indicate a gradual decrease in emissions from the agricultural sector since 2020.

The recalculation of the GHG emissions for the current report was conducted for the base year and for the years 2020-2024. The results for NDC tracking are presented in the Figure below.

Sector	1990, Mt CO2-eq	2022, Mt CO2-eq	2023, Mt CO2-eq	2024, Mt CO2-eq	Change, in Mt CO2-eq vs 1990	Change vs 1990	Change vs 2023
Energy	**80.158**	60.471	62.198	59.671	**−20.487**	**−25.56%**	−4.06%
IPPU	1.246	3.659	4.138	4.581	+3.335	+267.53%	+10.72%
Agriculture	4.565	6.760	6.692	6.505	+1.941	+42.52%	−2.78%
LULUCF	−4.000	−5.206	−5.413	−5.397	−1.398	+34.94% removals	−0.28% removals
Waste	2.760	5.058	5.158	5.241	+2.482	+89.93%	+1.62%
TOTAL incl. LULUCF	**84.729**	70.741	72.772	70.601	**−14.128**	**−16.67%**	−2.98%

Table 1. Comparative analysis of GHG inventory results for 1990 and 2024.

The amount of GHG emissions in 1990 was 84,729 kt CO_2 equivalent, while in 2024 it was 70,561 kt CO_2 equivalent (net emissions), resulting in a 16.674% decrease in GHG emissions over this period. Despite the increased demand for natural resources due to population growth, the significant reduction in emissions in the country can primarily be attributed to an 25.78% decrease in the Energy sector.

The LULUCF sector in Azerbaijan has historically been recognized as a carbon sink sector, with forests playing a significant role in carbon sequestration. The increase in emissions due to the reduction of carbon dioxide absorption in grasslands and croplands is associated with the conversion of grasslands into croplands and residential areas, the development of livestock farms, and the rising number of cattle grazing in pasture lands.

Emissions have significantly increased due to rising activities in the IPPU, Agriculture and Waste sectors. While emissions in the Energy sector was 59.671 Mt CO_2 in 2024 and therefore, have decreased in by 25.56% compared to 1990. Despite the fact that energy sector emissions in 2024 have decreased by 4.06% compared to 2023 due to the relevant efficient mitigation policies and measures particularly in power stations (by 21.2% in HPs and 12.8% in CHPs) and some oil-gas sector categories, the sector still remains the largest contributor to the country's total annual emissions.

3.2.1 EMISSIONS DYNAMİCS IN THE ENERGY SECTOR

In the energy sector, GHG emissions were 80.158 kt. CO_2 equivalent in 1990, whereas they decreased to 59,671 kt CO_2 equivalent in 2024, representing a 25.56% reduction. The reduction of emissions occurred despite population growth, primarily due to the widespread adoption of energy-efficient technologies and the transition from using mazut to natural gas in the country. The results of the analyses indicate that without these measures, GHG emissions from the sector would not have decreased but would have instead increased.

The reduction in emissions in the sector is linked to the economic growth decline due to the collapse of the Soviet Union, when the country lost traditional economic relations with former soviet republics and moved away from energy-intensive technologies and the use of coal and oil for electricity generation. The subsequent recovery of the economy, along with reforms in the energy sector, particularly led to improved energy efficiency in energy production. This also played a crucial role in the reduction of emissions, with investments in natural gas infrastructure.

3.2.1.1 EMISSIONS IN FUEL COMBUSTION ACTIVITIES (1.A)

As the economy distanced itself from the inefficient, high-energy-intensive infrastructure inherited from the Soviet era, emissions from the energy industry, particularly from public electricity and heat generation, have decreased by 27% in fuel combustion activities (1.A). The restructuring of industry and modernization of industrial infrastructure during the post-Soviet period also contributed to the reduction of emissions from fuel combustion. Besides, government-initiated energy efficiency programs have helped to reduce the carbon intensity of energy use in industry and commerce.

However, since the early 2000s, emissions have been rising steadily due to population growth, economic expansion, and high demand for energy products, particularly in the transportation and residential sectors.

In another category of the sector, Manufacturing Industries and Construction (1.A.2), a reduction of 81.5% was observed in 2024 compared to 1990. This is primarily reflective of the decline of heavy industries from the Soviet era, particularly energy-intensive industries such as steel production and similar sectors. Many of these industries have not been fully restored, and switching to a more service-oriented economy has limited energy demand in this sector, contributing to the reduction of GHG emissions.

3.2.1.2 FUGITIVE EMISSIONS FROM OIL AND GAS EXTRACTION (NATURAL GAS ACTIVITIES) (1.B)

Emissions from this subcategory remain traditionally high, although certain reductions were achieved in recent years due to the improved management practices and technological improvements. The oil and gas sector continues to dominate emissions within the country, primarily due to high fugitive emissions resulting from oil and gas extraction. However, improvements in leak detection and repair (LDAR) systems, especially due to foreign investments in Azerbaijan's energy infrastructure, have helped to

conduct a more reliable monitoring of emissions. Overall quantity of fugitive emissions has been decreased by 18.2% in 2024 compared to 1990.

3.2.2. EMISSIONS DYNAMİCS IN THE INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU) SECTOR

In Azerbaijan, the IPPU sector has exhibited various trends in emissions over time, closely linked to the country's industrial activities. With the development of infrastructure and urbanization, emissions from the mineral industry, particularly cement production, have consistently increased. Fluctuations in emissions have also been observed in the chemical industry and metal production sectors, including iron, steel, and aluminum. While emissions from some industrial sectors have remained relatively stable, the overall trend, particularly the rise in emissions from petrochemical production, draws attention. Economic changes such as the expansion of the manufacturing industry and construction sectors, along with the recovery of the industry after the post-Soviet era, have contributed to the increase in industrial emissions. Despite several modernization measures within the sector, the IPPU continues to make a significant contribution to the total emissions of Azerbaijan. This is evidenced by a 267.53 % increase in emissions from the sector from 1990 to 2024.

Analyses show that Azerbaijan's industrial sector has expanded significantly over the past twenty years, primarily due to construction materials such as petrochemical and cement products. The development of Baku as a modern city and the improvement of the infrastructure along the Caspian Sea and other large-scale urbanization projects have significantly boosted the demand for such materials. The substantial increase in cement production associated with the construction boom has also significantly contributed to the rise in emissions generated by the sector. The approximately trifold increase in the mineral resources industry from 1990 to 2024 is clear evidence of these effects.

One potential source for reducing emissions in this sector will be the phase-out of ozone-depleting substances (ODS). So, according to the decisions of the Montreal Protocol, ODS shall be completely phased out by

2030. The phasing-out of these substances in Azerbaijan will significantly impact the reduction of GHG emissions from this sector.

Moreover, By Law No. 257-VIIQ of September 30, 2025 and entered into force on October 14, 2025, the republic ratified the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, and became the 171st state to ratify this Amendment. Azerbaijan submitted the ratification document to the UN Treaty Depository on November 24, 2025; The Kigali amendment will take effect 90 days after the deposit date of February 22, 2026. Key obligations arising from the Kigali Amendment:

-"freezing" hydrofluorocarbon (HFC) production and consumption at 2024 levels;

-Reducing HFC consumption by 80% by 2045 compared to the 2020-2022 baseline;

- continuation of previous commitments to phase out hydrochlorofluorocarbons (HCFCs), including a 65% reduction in HCFC consumption from the 2009-2010 years baseline.

Actually, HFC and HCFC are not produced in Azerbaijan, but these substances are widely used in the country. The main area of consumption is the sector of refrigeration and air conditioning equipment - including household cooling systems, commercial cooling (supermarkets, refrigeration warehouses) and industrial refrigeration units.

3.2.3 EMISSIONS DYNAMİCS IN THE AGRICULTURE SECTOR

In Azerbaijan's agriculture sector, in the time series of the reporting period, there has been observed a notable increase in emissions, primarily related to the growth in livestock, especially a rise in the number of cattle. The increase in emissions resulting from enteric fermentation and manure management is a direct consequence of the expansion of livestock production.

The expansion of livestock farming, in turn, reflects a greater focus on increasing agricultural output to ensure food security for the growing population and support rural economies. It is worth noting that a significant portion of livestock products is imported to meet the country's domestic demand. Additionally, waste from agricultural lands has increased mainly due to the intensification of farming practices and the use of fertilizers.

Overall, the emission trends in the sector highlight the impact of increasing agricultural activities following economic changes and modernization efforts in rural areas after the collapse of the Soviet Union. As a crucial com-ponent of Azerbaijan's economy, agriculture continues to contribute significantly to national emissions. An increase of 42.52% was recorded in the quantity of emissions from the sector in 2024 compared to 1990. The main part (majority) of this increase falls in the livestock category. Interestingly, during the period from 2020 to 2024, the increase in GHG emissions in the livestock category was replaced by a decrease.

3.2.4 EMISSIONS DYNAMİCS IN THE LAND USE, LAND USE CHANGE, AND FORESTRY (LULUCF) SECTOR

In the LULUCF sector, there has been a 34.94% increase in carbon sequestration. Currently, carbon sequestration in Azerbaijan's LULUCF sector is primarily influenced by forests and agricultural lands, which play an important role in carbon capture. Changes in the amount of carbon sequestered in forest areas are linked to afforestation, reforestation, and sanitary-cleaning activities conducted in different years.

The increase in carbon sequestration from croplands is associated with the expansion of cropland areas and the implementation of new technologies in land management. However, a decrease in carbon sequestration has been observed in some lands. Examples of this include fallow lands and perennial crops. This decrease is related to land use changes.

3.2.5 EMISSIONS DYNAMİCS IN THE WASTE SECTOR

In the county's waste sector, a significant increase in emissions (89.93%) has been observed from 1990 to 2024, and this rise happens primarily due to the population growth and high urbanization level, which have intensified pressure on solid waste disposal and wastewater treatment fields.

Achievements in the field of waste management in Baku have positively impacted the reduction of emissions from the sector. However, problems related to waste management in the country's regions, including other major cities, are contributing to the increase in emissions from this sector.

Both managed and unmanaged waste disposal sites are major contributors to emissions, with municipal waste-water being a source of CH_4 and N_2O. To mitigate the environmental impacts of waste, there is a need for improved management systems and sustainable treatment solutions.

3.3 INSTITUTIONAL ARRANGEMENTS

According to the Article 4 of the Paris Agreement and in accordance with paragraph 61 of the MPG, each country's latest biennial transparency report (BTR) shall reflect the existing institutional measures to monitor progress made in the implementation of its NDCs, including monitoring of transmitted support for mitigation at the international level, including any changes in institutional measures.

After the adoption of the Paris Agreement in December 2015, countries began to implement their climate obligations, or "nationally defined contributions" (NDC). However, while many developing countries do not have the tools to measure, report, and verify progress on climate commitments and activities, there is no significant barrier in Azerbaijan to measuring or verifying this progress.

The data includes procedures and guidelines that allow monitoring of NDC progress, particularly through GHG emission accounting, quantification, and disclosure, that allow to determine impact mitigation

measures in different sectors and how those sectors behave in relation to GHG emissions reduction targets. These indicators are also a valuable tool to help better understand the emission profile in the country and are the basis for structuring public policy at the national level.

After ratifying the UN Framework Convention on Climate Change in 1995 and the Kyoto Protocol in 2000, the Republic of Azerbaijan joined international efforts to mitigate the negative effects of global climate change. As a party that is not a part of Annex I of the Convention, it undertook obligations before the convention to prepare, regularly update the cadaster of anthropogenic emissions and absorbers of GHG emissions, prepare national information, educate the public, and submit this information to the Conference of the parties to the Convention, and these obligations are systematically fulfilled.

A number of institutional measures have been taken for coordination of the work carried out in this direction and conduct it in a more planned manner. Thus, by the Decree of the President of the Republic of Azerbaijan dated April 30, 1997.

Although Azerbaijan, as a member country not included in the Annex I group of the Convention, has not taken quantitative obligations under the Kyoto Protocol to reduce gases that create a heat effect, a number of measures have been implemented in the country to mitigate the effects of climate change.

Examples of these are the expansion of the use of renewable energy sources, increasing energy efficiency through the use of more efficient technologies in the energy sector, afforestation of new areas, the use of gas instead of fuel oil in thermal power plants, improving the management of household waste, etc.

Azerbaijan considers it expedient to base the fulfillment of obligations under the Paris Agreement on the principles of fairness and mutual respect and, at the same time, the correspondence of mitigation obligations to the main principles of the Convention, in particular, the principle of common but different responsibility and accountability, as well as the correspondence of countries to the existing potential and capabilities of countries, and that developed countries should play a leading role in this matter and support developing countries.

As an independent state, the Republic of Azerbaijan has already defined its national development priorities and strategies and has adopted the issue of environmental protection as one of the main priority issues.

Implementation of mitigation activities in order to keep the global temperature increase below 1.5 or 2ºC is of special importance for Azerbaijan, and a number of projects have been implemented in this direction, are being implemented, and are being planned in various sectors of the economy.

The Nationally Determined Contributions developed by countries under the Paris Agreement are intended as the main implementation tool for the post-2020 period to achieve the long-term goals of the Paris Agreement. In this context, NDCs serve as a key roadmap to identify and strengthen countries' efforts and contributions to combat climate change, including adaptation linkages.

The Ministry of Ecology and Natural Resources is the state body that performs the coordinating function in the field of institutional regulation related to emissions management and climate change in Azerbaijan. Ministry of Economy, Ministry of Emergency Situations, Ministry of Energy, Ministry of Agriculture, Ministry of Health, Ministry of Digital Development and Transport, Ministry of Finance, Ministry of Science and Education, State Urban Planning and Architecture Committee, State Statistics Committee, Azerbaijan State Water Resources Agency, Azerbaijan National Sciences Academy, SOCAR, "Azerenergy" OJSC, "Azerishig" OJSC, "Azeristiliktechizat" OJSC, "Tamiz Sheher" OJSC, local executive authorities, including municipalities, implement measures in this field. The afore-mentioned institutions operate within the authorities established by the legislation according to their statutes.

There is a coordination mechanism in the country where relevant stakeholders are represented in relation to climate change. Recently, based on international experience, noticeable structural changes have been made in all fields of activity of the country. Therefore, on March 11, 2020, the President of the Republic of Azerbaijan made changes and additions to the composition of the State Commission and approved the new structure of the Com-mission as follows:

- Chairman of the State Commission-Deputy Prime Minister of the Republic of Azerbaijan;

- Deputy Chairman of the State Commission-Minister of Ecology and Natural Resources of the Republic of Azerbaijan;
- Members of the State Commission:
- Minister of Finance of the Republic of Azerbaijan
- Minister of Economy of the Republic of Azerbaijan
- Minister of Agriculture of the Republic of Azerbaijan
- Minister of Health of the Republic of Azerbaijan
- Minister of Science and Education of the Republic of Azerbaijan
- Deputy Minister of Foreign Affairs of the Republic of Azerbaijan
- Deputy Minister of Digital Development and Transport of the Republic of Azerbaijan
- Deputy Minister of Energy of the Republic of Azerbaijan
- Deputy Minister of Emergency Situations of the Republic of Azerbaijan
- Chairman of Azerbaijan State Water Resources Agency
- First Deputy Chairman of the State Urban Planning and Architecture Committee of the Republic of Azerbaijan
- Deputy Chairman of the State Statistics Committee of the Republic of Azerbaijan
- President of the State Oil Company of the Republic of Azerbaijan (SOCAR)
- President of "Azerenergy" Open Joint Stock Company.

The Commission conducts inter-ministerial coordination in accordance with its authorities and activity directions by managing works done and planned in the field of climate change.

The Ministry of Ecology and Natural Resources (MENR) of the Republic of Azerbaijan has been appointed as the coordinating state structure for preparation and monitoring of implementation of the climate policy, including establishment and operationalization of MR. Projects

planned to be implemented in the field of climate are monitored, evaluated, and submitted to the State Commission on Climate Change and Atmospheric Air Protection by MENR.

A number of activity directions that are in line with the Paris Agreement have been specified in the "Socio-economic Development Strategy of the Republic of Azerbaijan in 2022-2026." Among other things, one of the priority activities in the action plan of the strategy is "Inventory of gases that create heating effect and development of monitoring, measurement, reporting, and verification (MRV) systems." In the strategy, MENR is the main executive organization for this activity, and the Ministry of Economy, Ministry of Ecology, MA, MDDT, SOCAR, "Azerenergy" OJSC, and ANAS are specified as other auxiliary executive organizations. Implementation of the activity is planned for 2022-2026. In the action plan, the preparation of institutional proposals for the creation of the MRV system for 2023-2025 as an intermediate result of the activity and the creation of an Institutional Framework based on the modern experience of the MRV system will be reflected in the relevant Law on Climate, that’s under preparation.

The preliminary draft of the proposed Institutional Framework of MRV has been developed:

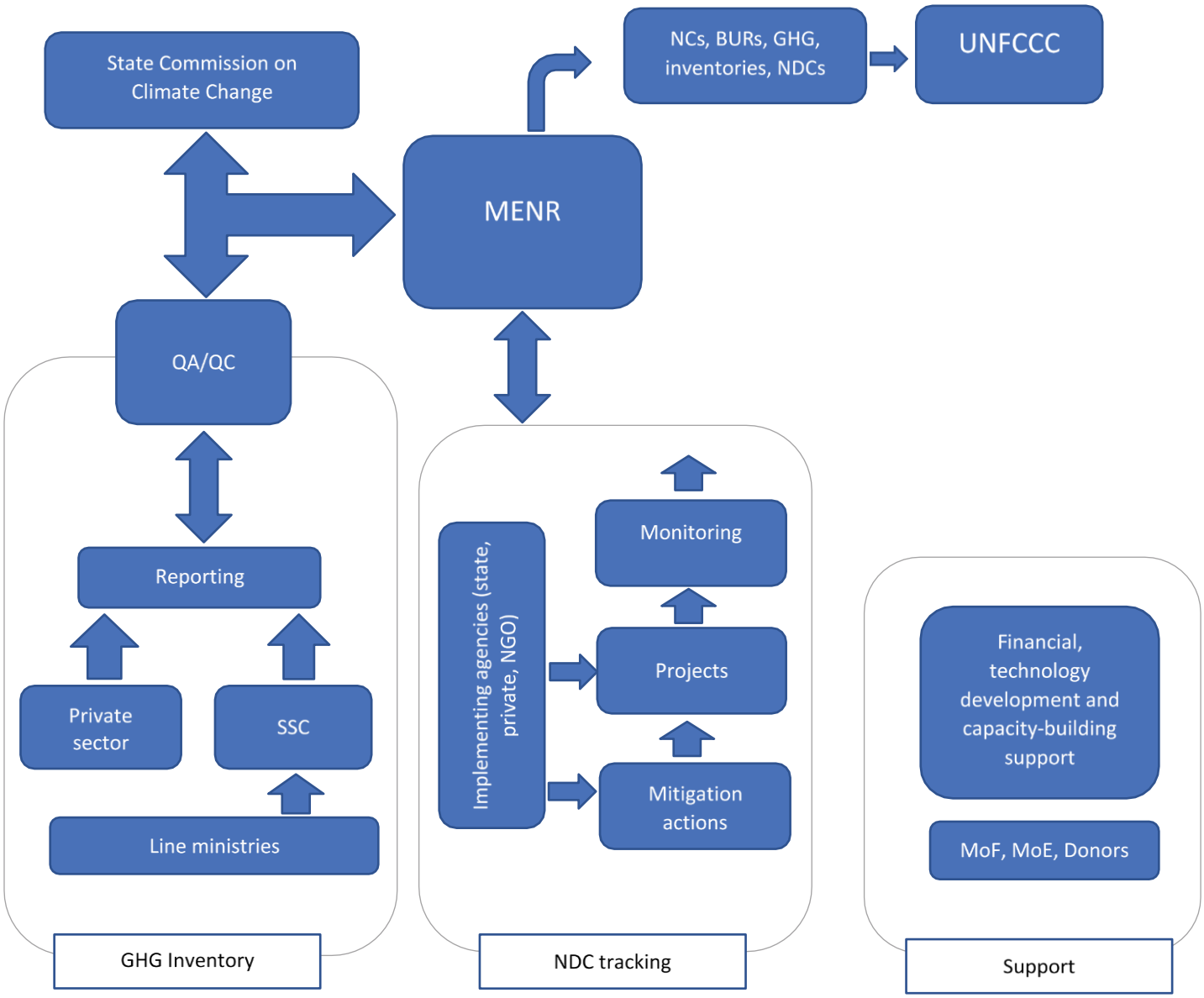


Figure 1. Institutional Framework on MRV in Azerbaijan

The MRV system for climate change mitigation involves not only the Azerbaijan government's current vision for the design and implementation of MRV but also the country's LTS and NDC targets to be tracked and implemented in a way that allows for the requirements of the Enhanced Transparency Framework.

MENR is proposed to be the coordinating body of the MRV system. The coordinating body is responsible for all coordination activities for the MRV system, in addition to compiling the inventory of all reports (e.g., NC, BTR) required under the UNFCCC.

The following main roles and responsibilities are proposed for the Commission:

- General management and control over climate activities;
- Formulation of strategies and activities that promote the implementation of mitigation and adaptation measures;
- Specifying roles and responsibilities of involved institutions.

At the same time, the reporting requirements for expanding the MRV system and future activities under the Paris Agreement were defined:

- Approval of sectoral action plans to be prepared by relevant ministries related to climate change;
- Elimination of obstacles encountered during the collection and management of information related to climate changes;
- Accepting climate financing as a separate priority in the budget for climate change adaptation and mitigation projects;
- Prioritizing and approving projects submitted for financing (e.g., GEF or GCF);
- Discussing and approving any updates to the NDC.

The State Commission on Climate Change and Atmospheric Air Protection organizes discussions on the draft of Climate Law, implementation of the Long-Term Low-Carbon Development Strategy, MRV, GHG cadaster, BTRs, NDCs, and other draft reports to the UNFCCC with the relevant ministries and ensures decision-making.

The role of the coordinating body is important in the sustainable development of the MRV system. It is extremely important to determine and implement a number of measures necessary for the further development of MENR in the short and long term. The development of specific templates, methodologies, and standards is essential for a functional MRV

system, particularly when the country plans to establish internal carbon pricing mechanism and participate in the international carbon market.

There are international financial opportunities to ensure the activities of the coordinating institution. For example, improvements can be made by using GEF funds and the Capacity Building Initiative for Transparency to develop the MRV.

If the funding mechanism under the UNFCCC changes in the future, it may be necessary to identify addition-al/alternative funding sources for the proposed structure. In this case, consideration may be given to allocating additional funds to MENR for the implementation of MRV activities and the creation of proposed new units.

Acting as the deputy chairman of the State Commission on Climate Change and Atmospheric Air Protection, MENR coordinates all work, including mitigation measures. So, in order to receive assistance from QEF, GCF, and other financial organizations for all mitigation projects, the projects are registered in MENR. MENR conducts monitoring and environmental expertise of proposed projects related to UN executive bodies. If the project is interesting in terms of reducing GHG emissions, MENR applies to the relevant financial institution for support.

Institutional structure dealing with climate change combat are being progressively strengthened. Actually, the Climate Policy Department within the Apparatus of the Ministry of Ecology and Natural Resources (MENR) was established in 2026, the Department possess a mandate of preparation of climate related strategic documents (the recent one was Long-Term Low-Carbon Development Strategy-LTS approved by the government on 21.10.26), drafts of legislative acts and Cabinet of Ministers decisions, programs, as well as facilitates the work of the State Commission on Climate Change and Atmospheric Air Protection, coordinates national and international climate reporting, takes part and provides technical coordination and methodological support to preparation of the greenhouse gas inventory (undertaken by the Climate and Meteorological Research Centre of the National Hydrometeorological Service under the MENR), preparation, assessment and monitoring of implementation of the mitigation and adaptation policies, MRV enhancement policies and measurement in cooperation with other stakeholders. The ongoing development of the Climate Law is expected to further strengthen the legal and procedural basis for regular data provision, MRV and national inventory preparation, national carbon market and participation in international carbon markets.

The Ministry of Economy participates in the preparation of state programs for socio-economic development and state programs for the development of regions, focusing on issues related to environmental protection, climate change, investments in these areas, and their

coordination. The Ministry of Economy monitors socio-economic projects as well as environmental projects. The main purpose of this monitoring is to assess the achievements in all sectors and summarize them at the country level. Information about the projects is collected through a special template. There is no specific indicator for collecting data on mitigation activities in this template. In this regard, there is a great need to develop and improve the MRV system. Currently, relevant measures are being implemented within the action plan of the "Socio-economic Development Strategy of the Republic of Azerbaijan in 2022-2026" adopted for the implementation of "Azerbaijan 2030: National Priorities for Socio-economic Development.".

The Ministry of Energy carries out the following tasks in the field of climate change combat activities:

- to develop and implement action plans for ensuring energy efficiency, enlargement of renewable energy sources (RES), as well as environmental safety in cooperation with relevant executive authorities and coordinate efforts towards increasing the energy use efficiency and RES;
- to ensure the development and implementation of measures for the efficient use of natural resources, including energy resources, as well as measures to reduce GHG, waste management, in accordance with its authorities and in coordination with the relevant executive authorities;
- to monitor the activities of relevant field enterprises in accordance with civil, energy, and environmental legislation, to apply field standards in these industries, and to monitor their implementation.
- prevention waste released into the atmosphere

The Ministry of Emergency Situations establishes guidelines for the development and approval of safety reports for industrial and mining sites that may pose a threat. The responsibilities of the Ministry regarding the climate change issues are as follows:

- to ensure the organization and implementation of measures to eliminate the negative consequences of climate change related natural hazard (i.e. floods, inundation, landslides, etc.).
- to coordinate and control the activities related to the collection, transportation, recycling, storage, and landfill of radioactive waste, including the construction, use, maintenance, and decommissioning of facilities working with radioactive waste, regardless of the ownership form;
- to carry out radioecological monitoring of the environment to ensure

the radiation safety of the population and the territory.

The Ministry of Agriculture exercises the following authorities in relation to the mentioned field:

- to provide information on activity data for GHG inventory, as well as on mitigation, adaptation policies and measures;
- to carry out effective agrotechnical, reclamation, phytosanitary, erosion control, and desertification prevention procedures in the field of restoration and protection of soil fertility, as well as protection of field protection forests;
- to reduce the negative effects of waste generated during agricultural production, especially in the field of animal husbandry, on the environment, atmosphere, and human health, and to adopt strategies for efficient use of these wastes;
- to work together with local organizations to identify activity data on GHG in livestock enterprises, farms, and storage areas of agricultural products, eliminate their negative effects, and prevent waste from posing a threat to the environment and human health.

The Ministry has a special department dealing with climate change within the division on environmental issues, although with limited expert capacity.

In addition to its other main duties, the Ministry of Digital Development and Transport has the following authorities regarding the protection of the environment, especially the atmosphere:

- to create a database of relevant technological, technical, economic, financial, social, ecological, and other information related to the transport, road, and communication complex;
- to control the planning and implementation of measures such as prevention of the discharge of pollutants into the environment, especially into the atmosphere, from transport and communication systems.

The Ministry of Ecology and Natural Resources and the Ministry of Health are partners in the activities of the relevant institutions of the Ministry of Emergency Situations in the direction of environmental protection and elimination of ecological disasters.

SOCAR develops and implements comprehensive policies and measures on climate change, particularly methane reduction that will be described here-below in this Chapter, as well as measures on reduction of environmental and atmospheric pollution in oil-gas production and processing enterprises, capture and use of GHGs, clean up polluted areas

and make them environmentally clean, and accelerate gasification works in order to reduce some deforestation activities for energy purposes. The company ensures that necessary measures are taken to prevent emissions to the environment and atmosphere during the transportation and export of oil and gas products from its oil and gas processing facilities.

Municipalities develop and implement environmental protection initiatives within their jurisdiction and participate in the management of lands, forested areas, and public open green spaces under their control and use.

In their activities, civil society and non-governmental organizations pay special attention to the issues of environmental protection, including atmosphere protection, climate change, and sustainable management of natural resources. Currently, there are more than 4,000 officially registered NGOs in the country. Approximately, 100 of them focus on the environment and the use of natural resources and play an active role in the implementation of projects in these areas. They contribute to the collection of information on climate change, help to disseminate the results of the initiatives implemented, being engaged in discussion of new legal acts on environment, climate change, various environmental projects, raise awareness among local communities and those most vulnerable to it.

The mass media of the country constantly focus on the issues of environmental protection, climate change, waste management, and sustainable management of natural resources. There are periodicals specialized in the fields of environment and nature. Measurement of the impact of mitigation and adaptation measures implemented in Azerbaijan is carried out by each relevant executive agency together with Ministry of Ecology and Natural Resources. State institutions, municipalities, NGOs, private institutions, or any other organizations and institutions that carry out mitigation activities can act as executors.

4. DESCRIPTION OF INITIAL NATIONALLY DETERMINED CONTRIBUTIONS UNDER ARTICLE 4 OF THE PARIS AGREEMENT

The Paris Agreement of the United Nations Framework Convention on Climate Change is a legally binding international treaty on climate change.

It was adopted by 196 countries at the 21st Conference of the Parties held in Paris on December 12, 2015. The main goal of the Paris Agreement is to limit global warming to below 2°C compared to pre-industrial levels (1750) and, if possible, to limit the increase to 1.5°C. To achieve these long-term temperature goals, countries aim to contribute to reducing global GHG emissions within their capabilities and to reach a carbon-neutral economy as soon as possible.

Unlike the Kyoto Protocol (under which only developed countries have commitments), the PA is the first international treaty on climate change to engage all countries in multilateral and ambitious efforts to combat climate change and adapt to its impacts.

The implementation of the goals of the PA requires unprecedented economic and social changes based on existing science on a global scale. It is designed for countries to commit to increasingly ambitious PA climate action in five-year cycles. By 2020, countries submitted their climate action plans known as Nationally Determined Contributions (NDCs) and are now in the process of presenting enhanced NDCs for the next five years. Countries outline measures to reduce greenhouse gas (GHG) emissions in their NDCs to achieve the goals of the PA, as well as provide information on adaptation measures to cope with the impacts of rising temperatures. In addition to NDCs that cover five-year cycles, the PA encourages countries to develop and present long-term low-emission development strategies (LT-LEDS) to better frame their efforts towards long-term goals.

The Enhanced Transparency Framework (ETF) has been established under the Paris Agreement (PA) to monitor all these processes related to NDCs and for tracking progress on a global scale. Under this framework, starting in 2024, countries shall provide transparency reports on measures taken and progress made in reducing GHG emissions, adaptation, financing and other support mechanisms. The data collected through the ETF will facilitate the assessment of collective progress toward long-term climate goals and enable global inventories. This framework will also provide clarity for recommending more ambitious plans to countries in further stages. and monitor progress over time to achieve ambitious and realistic NDCs. For countries to achieve ambitious and realistic NDCs, it is crucial to assess their potential, raise awareness on climate strategy development and possess the capability to monitor progress over time. During the

assessment of potential in the UNFCCC processes, the key focus is on national priorities, sectoral programs, institutional frameworks, standards, databases and access to them (their accessibility), mitigation activities, specific needs related to intersecting issues, access to climate finance, governance and coordination, gender responsiveness and other relevant elements.

As part of its contributions to global climate change mitigation initiatives, the Republic of Azerbaijan has set a target of reducing GHG emissions by 35% by 2030 compared to the 1990 baseline year in its Nationally Determined Contributions. The Republic of Azerbaijan reaffirmed its commitment to combating climate change and solidarity with the most vulnerable countries by submitting its NDC document to the UN Framework Convention on Climate Change in 2015.

In accordance with national conditions, Azerbaijan has undertaken obligations on GHG emissions in its INDC and on other sectors, except for the IPPU sector. Thus, since there was no information about globally competitive green technologies in cement and iron/steel production processes, which were the key categories of IPPU at that time, no commitments for this sector were determined and included in the country's NDC. It is important to note that the commitments made in the first NDC do not include specific quantitative targets for each sector and the commitment to reduce emissions by 35% by 2030 compared to the base year of 1990 is taken as an overall target for the country as a whole.

Meanwhile, in the period before 2015, when time limitations, resource constraints and uncertainties were still high, no specific adaptation measures were reported, even though the country stated in its NDC document that it had placed special emphasis on adaptation activities. Although the NDC does not provide quantitative commitments by sector, it clearly gives significant attention to the energy sector, which plays a crucial role in the country's emissions. Below are details of the commitments made in the country’s NDC regarding GHG emissions and absorptions by sector.

4.1 ENERGY SECTOR

Improvement of legislative acts on energy, implementation of energy efficiency awareness activities and replacement of existing electricity and heat generation technologies with modern technologies, reconstruction of distribution networks and transmission lines, insulation works to prevent energy losses and the application of modern lighting solutions.

4.1.1 OIL AND GAS SECTOR

SOCAR's **Decarbonization Action Plan for 2022–2050** has been approved and presented at the COP28 event held in Dubai in December 2023. The optimization and emission reduction measures envisaged under the Plan cover all areas of SOCAR's operations. The primary objectives are to ensure the efficient use of energy and other resources, optimize operational processes, and reduce energy intensity and greenhouse gas emissions. In parallel, measures for the monitoring and reduction of methane emissions primarily cover **oil and gas production and transportation activities, including the Upstream and Midstream segments**. Reduction of losses in the gas distribution system by 2020 through modernization of gas pipelines and other measures, and adaptation of the reduction level to international standards by 2050;

Accumulation of gases released into the atmosphere and prevention of gas leaks in oil and gas processing and distribution networks in accordance with the strategy adopted during oil and gas extraction.

4.1.2 RESIDENTIAL AND COMMERCIAL SECTOR

Organization of education programs related to mass use of control and measurement devices in electrical and thermal energies, as well as natural gas systems used by the population, introduction of energy-efficient lamps, the use of modern energy-saving technologies in heating systems and raising public awareness of energy use.

4.1.3 USE OF ALTERNATIVE AND RENEWABLE ENERGY SOURCES

The development and implementation of technical normative legal documents regarding the use of alternative and renewable energy sources, accelerating provision of the population's heat supply systems with

renewable energy, expanding the use of innovative technologies and constructing small hydropower plants on small rivers, irrigation canals and water bodies of the Republic of Azerbaijan, as well as the use of biomass, solar, electricity and thermal energy, wind energy, heat pumps and geothermal energy in all sectors of the economy based on the assessments conducted.

4.1.4 TRANSPORT SECTOR

The introduction of environmentally friendly modes of transportation, the expansion of the use of electric modes of transport in passenger transportation, electrification of railway lines and switching to alternating current traction systems, improvement of the intelligent transport management systems and expansion of their scope, the development of metro systems and increasing the number of stations, as well as the construction of under-ground and above-ground pedestrian crossings to alleviate traffic jams.

4.2 AGRICULTURE SECTOR

Collection of methane gas generated from livestock and poultry farm manure and utilization of renewable energy and application of modern technologies.

4.3 LULUCF SECTOR

The establishment of new forest massifs, water and soil-protective forest belts, urban and roadside greenery, as well as further improvement of agricultural land and pasture management.

4.4 WASTE SECTOR

Development of modern methods of solid municipal waste management in big cities of the country.

5 UPDATES TO

NATIONALLY DETERMINED CONTRIBUTIONS

In 2023, Azerbaijan updated its commitments under the NDCs and submitted its next NDC. The updated commitments indicate a target of a 40% reduction in GHG emissions by 2050 compared to the 1990 baseline year.

In line with its commitment to the Paris Agreement, Azerbaijan pursues efforts to limit the global average temperature rise to 1.5C above pre-industrial levels. In its NDC3.0 that was submitted during COP30 in 2025, the country declared a target to achieve 40% emissions reduction by 2035 compared to 1990 level. Moreover, the country has pledged to make every possible effort to achieve net-zero emissions by 2060. However, the success of this goal depends on securing substantial international financial support, bridging gaps in technology and infrastructure, and fostering strong international cooperation. To meet the Net-Zero ambition, Azerbaijan has prepared the Long-Term Low-Carbon Development Strategy (LTS) to the Cabinet of Ministers, outlining a comprehensive decarbonization plan, including detailed themes and levers, to achieve a 40% reduction in emissions by 2035 and Net-Zero emissions by 2060. The LTS and NDC 3.0 are complementary but distinct in their roles within the nation's climate action framework. Both share the same timeframe for targets, addressing near-term and long-term objectives in line with the broader vision of achieving Net-Zero emissions by 2060. The development of both documents followed a consistent decarbonization strategy, utilizing the same datasets, modeling approaches, and qualitative insights. Together, the NDC and LTS create a unified and transparent narrative that communicates the country's decarbonization journey, aligning its short- and long-term climate ambitions with international commitments under the Paris Agreement.

By 2035, the most efficient and developed technologies are planned to be implemented, including energy efficiency measures, methane reduction, transition to electric vehicle (EV) transportation, shift to renewable energy sources (RES). Reducing climate-related risks and taking action are essential for environmental sustainability and economic diversification. Investing in green technologies and sustainable practices can create new revenue streams and generate jobs. Transitioning to a greener economy offers opportunities to innovate and develop industries that can prosper in a low-carbon future, thereby strengthening the country's economic resilience and competitiveness.

6 INFORMATION NECESSARY TO TRACK PROGRESS MADE IN IMPLEMENTING AND ACHIEVING NATIONALLY DETERMINED CONTRIBUTIONS UNDER ARTICLE 4 OF THE PARIS AGREEMENT

Azerbaijan has a robust economic growth since the early 2000s which has enabled extensive infrastructural development. The diversification of the economy was a key focus for the government, aiming to reduce reliance on hydrocarbons and utilizing respective benefits in developing other sectors. As it was mentioned the country has committed to achieving a 35% reduction in greenhouse gas (GHG) emissions by 2030 compared to the 1990 base-year level. This target aims to mitigate the growth of emissions by employing an economy-wide emissions reduction approach. Furthermore, NDC2 contains a new conditional target of reducing GHG emissions by 40% by 2050, and NDC. In its NDC3.0 has a new target to achieve 40% emissions reduction by 2035 compared to 1990 level; all these targets demonstrate country's ambition to align with global climate goals.

The mitigation target includes emissions and removals from all sectors and covers three key gases: CO_2, CH_4, and N_2O. These sectors include Energy (including Transport), Waste, Industrial Processes and Product Use (IPPU), Agriculture, and Land Use, Land Use Change, and Forestry (LULUCF).

As regards the trend of the national emissions profile, t*he base year level for total economy-wide emissions, according to the latest National GHG Inventory submitted with this Biennial Transparency Report (BTR), is 84,729 kt CO_2 eq. (net emissions). The target level for 2030 is 55,074 kt CO_2 eq that equals 35% reduction from the base year. As of the most recent reporting year (2024), the total net emissions were 70,601 kt CO_2 eq, which represents a 16.67% decrease from the base year level.*

Azerbaijan applies the 2006 IPCC Guidelines for National Greenhouse Gas Inventories to ensure accurate estimation and consistency. The accounting approach aligns with Article 4, paragraphs 13 and 14, of the Paris Agreement and follows the principles of Transparency, Accuracy, Consistency, Comparability, and Completeness (TACCC) to enhancing transparency and avoiding double counting. The same methodologies and accounting approaches are applied both to the national GHG inventory and the NDC to maintain consistency across reporting and implementation.

Additionally, QA/QC procedures have been applied to avoid double counting. Five sectoral focal points conduct quality control of activity data, while inventory experts validate the results in collaboration with international specialists. An IT-based MRV system is also being developed to further enhance transparency and data management.

Global Warming Potential (GWP) values from the IPCC Fifth Assessment Report (SAR) are used to convert GHGs to CO_2 equivalents. For LULUCF activities and harvested wood products, the IPCC Tier 1 approach and stock change method were utilized, respectively. Stratification of forestland based on age-class structure was partially applied due to data limitations; however, future reporting cycles will include more detailed stratification to improve estimates.

Azerbaijan ensures alignment between its NDC communication and national GHG inventory through the use of consistent data sources, methodologies, and assumptions. Any deviations or updates in the methodology are transparently documented in the National Inventory Document (NID) to maintain comparability over time. At present, Azerbaijan has not included mitigation co-benefits from adaptation actions or economic diversification plans in its NDC.

7 NATIONAL PRIORITIES AND STRATEGIES ON CLIMATE CHANGE MITIGATION

Azerbaijan’s economy continues to demonstrate resilience and sustainable growth. In 2025, the non-oil sector contributed 71.5% to the country's GDP, growing by 2.7% compared to 2024, driven by strong performance in agriculture, construction, and services, reflecting the government's ongoing efforts to reduce the economy's dependency on oil and gas.

Investment activity remained robust, with capital investments showing solid growth. Notably, investments in the non-oil sector demonstrated an increase, further strengthening economic diversification strategy. At the same time, the energy sector continues to play an important role in overall economic structure. Advancements in energy-related infrastructure enhance energy security through efficiency and reliability improvements, generating consistent revenue streams. The country has demonstrated substantial economic resilience and a strong commitment to climate action through strategic GDP growth, impactful climate change initiatives, and a dedicated shift towards the objectives of the Paris Agreement.

Azerbaijan's climate policy constitutes an integral component of the country's broader socio-economic development agenda and is underpinned by the objectives of advancing sustainable development, safeguarding the environment, ensuring the sustainable use of natural resources, and ultimately securing healthy and environmentally sound living conditions for the population.

The overarching short-term framework for the country's socio-economic development was established in "Azerbaijan 2030: National Priorities for Socio-Economic Development," approved by the Order of the President of the Republic of Azerbaijan on 02.02.2021. The document sets out Azerbaijan's strategic development vision through 2030 and identifies the following five National Priorities:

- a steadily growing and competitive economy;
- a dynamic and inclusive society based on social justice;
- competitive human capital and a space for modern innovations;
- the Great Return to the territories liberated from occupation; and
- a country of clean environment and "green growth."

The fifth national priority - "a country of clean environment and green growth" provides the comprehensive strategic framework for advancing environmental sustainability and strengthening national climate action. It establishes the policy basis for reducing pressures on the environment, promoting the sustainable and efficient use of natural resources, expanding green areas, facilitating the deployment of environmentally sound technologies, and enhancing the country's resilience to the adverse impacts of climate change.

The implementation of the National Priorities is supported by the "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026," which constitutes the first implementation stage of the Azerbaijan 2030 development agenda. The Strategy is aimed at establishing the institutional, economic, social and environmental foundations necessary to ensure sustainable development through 2030. Its objectives are closely aligned with the United Nations Sustainable Development Goals and the commitments arising from the 2030 Agenda for Sustainable Development.

Within the framework of the fifth National Priority, the Strategy defines two mutually reinforcing objectives - "High-quality environmental conditions" and "Green energy space." Implementation under these objectives encompasses climate change mitigation and adaptation, the development of national climate transparency and reporting systems, modernization of hydrometeorological observation and early-warning

infrastructure, protection and expansion of forests and green areas, and improvement of waste management systems.

The Strategy further establishes a comprehensive set of quantitative and policy targets aimed at improving environmental quality, promoting the sustainable and efficient use of natural resources, and advancing the transition towards a greener and more climate-resilient development pathway. In this context, the Strategy aims to increase the share of green areas in the country's total territory from 12 % to 12.3 %, reduce the share of unusable land from 25% to 15%, increase access to drinking water from 70 % to 85 % and irrigation water supply from 80% to 90%, and raise the waste recycling rate to 20 %, including 10 % in the regions. It also envisages increasing the share of specially protected natural areas to 10.5 % of the country's total land fund, completing the inventory of 65% of the State Forest Fund, and ensuring agrochemical analysis of 30 % of relevant land areas.

In parallel, the Strategy places particular emphasis on accelerating the transition towards a low-carbon and energy-efficient economy through the increased deployment of renewable energy sources and enhanced energy efficiency. It further provides for the wider use of environmentally friendly transport solutions and other green technologies as part of the country's efforts to address climate change. In the electricity sector, the share of renewable energy sources in total installed power generation capacity is targeted to reach 24 % by 2026, consistent with the longer-term target of 30 % by 2030.

Azerbaijan has continued to strengthen the institutional, technical and methodological framework for the inventory, monitoring and reporting of greenhouse gas emissions in accordance with the requirements of the Paris Agreement and its Enhanced Transparency Framework (ETF).

Sector-specific data collection mechanisms have been developed in accordance with the applicable IPCC methodologies, institutional arrangements for the preparation of the national greenhouse gas inventory have been further enhanced, and the technical architecture of the national Monitoring, Reporting and Verification (MRV) system has been established.

As part of these efforts, the national MRV system has been launched in a pilot mode through the digital Climate Transparency Platform. The platform integrates dedicated modules for the management of the national greenhouse gas inventory, tracking progress towards the implementation of the Nationally Determined Contribution, monitoring climate finance, and supporting climate-related reporting. Its pilot operation and functional enhancement have continued through the development of electronic

mechanisms for data entry, verification, updating and management, as well as the testing and refinement of data flows and user functionalities.

In parallel, efforts to further strengthen the legal and institutional framework for climate governance have continued through the preparation of the draft Law of the Republic of Azerbaijan "On Climate." An inter-agency working group has been established on 14.07.2026 by the Ministry of Ecology and Natural Resources (MENR) to facilitate the further refinement and coordination of the draft legislation.

Azerbaijan has continued to advance its climate change mitigation agenda through the progressive enhancement of its Nationally Determined Contributions and the development of a comprehensive long-term low-carbon development framework.

The country's updated Third Nationally Determined Contribution (NDC 3.0) was prepared and submitted to the Secretariat of the United Nations Framework Convention on Climate Change in the context of COP30.

In parallel, the draft Long-Term Low-Carbon Development Strategy (LTS) has been developed and submitted to the Cabinet of Minister, whereas after stakeholders' consultation process the document was approved on 21.10.2026 by the government.

Taken together, the NDCs and LTS processes provide an increasingly coherent framework for aligning Azerbaijan's medium-term climate commitments with its long-term socio-economic development priorities and for progressively mainstreaming decarbonization considerations across national development planning and sectoral policymaking.

Climate change adaptation constitutes an integral pillar of Azerbaijan's national climate policy. In this context, climate-related risks and the current and projected impacts of climate change have been assessed across vulnerable sectors, and the National Adaptation Plan (NAP) has been prepared and submitted to the UNFCCC Secretariat.

To facilitate the transition from strategic planning to implementation, a preliminary implementation plan for the NAP has been developed. These efforts contribute to the establishment of a more systematic and coordinated national adaptation framework based on climate-risk and vulnerability assessments, strengthened institutional coordination, and the progressive mainstreaming of climate resilience considerations into national and sectoral development planning.

The continued modernization and expansion of hydrometeorological observation and early-warning systems constitute an important component of Azerbaijan's efforts to strengthen climate resilience and improve preparedness for climate-related hazards.

The national observation infrastructure has been upgraded through the installation of automatic meteorological, hydrological and marine observation stations, Doppler meteorological radars and radiosonde systems by the National Hydrometeorological Service under the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan.

Actually, the national observation network currently comprises 69 automatic meteorological stations, 6 automatic marine stations, 40 automatic hydrological stations, 3 Doppler meteorological radars and 2 radiosonde systems. The expansion and modernization of this infrastructure have enhanced the continuity, accuracy and operational availability of observations and strengthened national capacities for forecasting hazardous hydrometeorological events and issuing timely early warnings. As part of the restoration and modernization of hydrometeorological services in the de-occupied territories, 11 automatic hydrological stations on 10 rivers and 5 automatic meteorological stations have been installed, with observation data transmitted to the central server for processing and analysis.

The protection, restoration and sustainable management of forests, together with afforestation and the expansion of green areas, constitute important components of Azerbaijan’s environmental and climate policy and contribute to the conservation and enhancement of natural carbon sinks.

As of the beginning of 2026, the total area of the forest fund of the Republic of Azerbaijan is 1,213,700.0 hectares, of which 1,060,124.94 hectares are covered by forests, representing 12.24% of the country's total land area. In 2024, forest restoration measures were implemented across a total area of 7,520.4 hectares, including the establishment of forest plantations through planting and sowing on 1,515.4 hectares of new areas and assisted natural regeneration measures on **6**,005 hectares. In 2025, forest restoration measures were implemented across a total area of 7,381.36 hectares, including the establishment of forest plantations through planting and sowing on 1,195.36 hectares of new areas and assisted natural regeneration measures on 6,186 hectares.

These measures contribute to enhancing ecosystem resilience, maintaining and increasing carbon sequestration capacity, reducing land degradation risks and supporting the achievement of the country’s broader environmental and climate objectives.

Moreover, the modernization of the waste management system constitutes an important component of Azerbaijan’s transition towards a cleaner, more resource-efficient and lower-emission development model. The relevant policies and measures have been implemented to further strengthen the regulatory, institutional and

technological framework governing waste management, while particular emphasis has been placed on the digitalization of waste tracking and control throughout the waste management chain, from generation and collection to treatment and final disposal. Thus, by the Presidential Decree dated 10 January 2025, the Digital Ecology Information System (REIS) and its Regulations were approved. Within the framework of REIS, the development and testing of the “State Control over Waste Management” subsystem have been completed, providing the technical basis for the centralized digital management and oversight of waste flows. The new specialized public entity - State Agency for Waste Management under the Ministry of Ecology and Natural Resources was established by the presidential decree "On additional measures in the field of improving waste management" on 14 May 2026. The Agency will be responsible for exercising the state control, regulation and coordination in the field of waste management (formation, collection, sorting, transportation, placement, processing, use, disposal, disposal and disposal of waste) and collection of fees for waste institution.

Infrastructure for the treatment of hazardous waste has also been strengthened, while initiatives promoting zero-waste approaches, separate collection, recycling and reuse have been advanced. In parallel, work has commenced on the preparation of a national strategy for improving municipal solid waste management for 2027-2030.

Collectively, these measures are expected to enhance the traceability and transparency of waste flows, increase resource recovery, improve the effectiveness of waste management and support the progressive transition towards circular economy principles.

The environmental restoration and climate-resilient development of the territories liberated from occupation constitute an integral component of Azerbaijan’s broader sustainable development and climate agenda and are being pursued within the framework of the First State Program on the Great Return to the Territories Liberated from Occupation of the Republic of Azerbaijan. Measures implemented in these territories encompass the restoration of forests and expansion of green areas, development of modern waste management infrastructure, restoration and modernization of hydrometeorological observation systems, and strengthening of early-warning capacities.

Implementation of the Azerbaijan-Türkiye International Forestry Training Centre, Smart Nursery Complex and Friendship Forest projects has continued. Furthermore, remote-sensing-based forest inventory activities have been completed across 56.9522 thousand hectares of State Forest Fund land, contributing to the establishment of an

improved evidence base for the sustainable management and restoration of forest resources in the liberated territories.

The integration of environmental restoration, resource efficiency, climate-resilient infrastructure and modern environmental monitoring systems into the reconstruction process contributes to embedding green, low-carbon and climate-resilient development principles into the long-term development of the liberated territories.

The implementation of Azerbaijan's climate and green development agenda is supported by a comprehensive and evolving framework of national strategies, State Programs, action plans and sector-specific policy instruments. These instruments complement "Azerbaijan 2030: National Priorities for Socio-Economic Development" and the "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026" and facilitate the systematic integration of environmental sustainability, climate change mitigation and adaptation, resource efficiency and resilience considerations into national, sectoral and regional development planning.

Key strategic and sectoral policy documents adopted and under implementation during the reporting period include:

- "Azerbaijan 2030: National Priorities for Socio-Economic Development";
- "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026";
- About measures related to the creation of a "green energy" zone in the liberated territories of the Republic of Azerbaijan;
- Strategic Roadmap for the development of communal services (supplying the population with electricity and thermal energy, water and natural gas) in the Republic of Azerbaijan;
- Strategic Roadmap for the production and processing of agricultural products in the Republic of Azerbaijan;
- "State Program on the development of tea growing in the Republic of Azerbaijan for 2018-2027";
- "State Program on intensive development of livestock and efficient use of pastures in the Republic of Azerbaijan in 2019-2023";
- "State Program on the development of cocooning and sericulture in the Republic of Azerbaijan for 2018-2025";
- "Strategic Roadmap for the development of heavy industry and machine building in the Republic of Azerbaijan";
- "State Program for the socio-economic development of the

regions of the Republic of Azerbaijan in 2019-2023";

- "State Program on the Development of Official Statistics in the Republic of Azerbaijan in 2018-2025";
- "First State Programme on the Great Return to the Territories Liberated from Occupation of the Republic of Azerbaijan";
- Action Plan for 2024-2027 for the implementation of the "National Strategy on the Efficient Use of Water Resources";
- "State Programme on the Socio-Economic Development of the Nakhchivan Autonomous Republic for 2023-2027" and its Detailed Action Plan for 2025-2027;
- "National Action Plan on Gender Equality (Equality of Women and Men) in the Republic of Azerbaijan for 2026-2028" and its Action Plan;
- "State Programme on the Development of Agricultural, Fisheries and Aquaculture Production and Processing Sectors in the Republic of Azerbaijan for 2026-2030" and its Action Plan;
- "State Program on the development of citrus fruit growing in the Republic of Azerbaijan for 2018-2025";
- Action Plan for the implementation of the "State Programme on the Improvement of Transport Infrastructure in Baku City and Surrounding Areas for 2025-2030";
- Action Plan for the implementation of the "State Programme on the Improvement of Water Supply, Stormwater and Wastewater Systems in Baku City and the Absheron Peninsula for 2026-2035".

Collectively, these strategic and sectoral policy instruments provide an integrated framework for mainstreaming climate considerations into national, sectoral and regional development planning. They support sustainable resource management, climate-resilient development and ecosystem resilience, while contributing to the implementation of Azerbaijan's climate commitments and alignment with the objectives of the Paris Agreement and the 2030 Agenda for Sustainable Development.

7.1 MITIGATION POLICIES AND MEASURES IN THE ENERGY SECTOR

Climate change policies have been reflected in the sectoral strategic roadmaps prepared for the national economy and key sectors of the economy in the Republic of Azerbaijan and approved by Presidential Decree No. 1138 of 6 December 2016: "Strategic Roadmap for the Development of the Oil and Gas Industry (including Chemical Products) in the Republic of

Azerbaijan", "Strategic Roadmap for the Development of Heavy Industry and Mechanical Engineering in the Republic of Azerbaijan", "Strategic Roadmap for the Development of Utilities (electricity and heat, water and gas) in the Republic of Azerbaijan" and "Strategic Roadmap for the Production and Processing of Agricultural Products in the Republic of Azerbaijan". These documents focus on climate change mitigation policies and measures for the period up to 2025 and beyond.

Before considering the overall abatement potential of the relevant mitigation polices in energy sector, it is necessary to admit the income generation potential and strategic importance of the sector for overall economy of the country, being a main engine of the sustainable development over last 30 years, as well as its huge mitigation potential.

First of all, the necessary normative-legal acts have been adopted for the development of the renewable or "green energy" sector and the formation of institutional mechanisms hereof, among which the Law of the Republic of Azerbaijan "On the use of renewable energy sources in the production of electricity" (2021) plays a crucial role.

Following the Decree of the President of the Republic of Azerbaijan "On accelerating reforms in the energy sector of the Republic of Azerbaijan" dated May 29, 2019, special attention is paid to attracting foreign investors to develop the renewable energy industry. To this end, a "Roadmap for the development of offshore wind energy in Azerbaijan" was prepared in cooperation with the International Finance Corporation and a Memorandum of Understanding was signed accordingly.

According to the Decree of the President of the Republic of Azerbaijan dated May 3, 2021 "On measures related to the creation of a "green energy" zone in the territories liberated from occupation of the Republic of Azerbaijan", the "Action Plan for the establishment of "green energy" zone in the liberated territories of the Republic of Azerbaijan in 2022-2026" was approved by the Cabinet of Ministers.

The "Socio-economic development strategy of the Republic of Azerbaijan in 2022-2026", outlines the directions of action related to increasing the use of renewable energy sources, as well as expanding the utilization of bioenergy and geothermal energy.

The document "Azerbaijan 2030: National Priorities for socio-economic development" emphasizes the significance of creating a "green energy" space. It also envisages expanding the application of "green technologies" and increasing the share of alternative and renewable energy

sources in consumption in all sectors of the economy based on scientific and technical potential.

In 2022, an Agreement was signed on strategic partnership in the field of "green energy" development and trans-mission between the governments of the Republic of Azerbaijan, Georgia, Romania and Hungary in Romania. As per this agreement, it is planned to export "green energy" produced in the Caspian Sea to Europe.

Declaring 2024 as the "Year of Solidarity for the Green World" in the Republic of Azerbaijan by the Decree of the President of the Republic of Azerbaijan dated December 25, 2023, demonstrates a strong focus on and commitment to environmental protection.

Azerbaijan has joined the global initiative to triple renewable energy capacity and double energy efficiency measures by 2030.

Azerbaijan has got a tremendous renewable energy potential. Thus, the technical potential of renewable energy resources is estimated at 135 GW onshore and 157 GW offshore. The technical potential by source is assessed at 15 GW for wind energy, 115 GW for solar energy, and 5 GW for hydropower. The economic potential is estimated at 27 GW onshore, including 3 GW for wind energy and 23 GW for solar energy, while the bioenergy potential is assessed at 380 MW and the potential of mountain rivers at 520 MW. The economic potential of the offshore areas is currently under assessment. As it's mentioned above, the law No. 339-VIQ of the Republic of Azerbaijan "On the Use of Renewable Energy in the Production of Electricity" dated May 31, 2021, has been adopted to develop the renewable energy sector in the country and improve the legislative and institutional environment in this field.

Nowadays, the Republic of Azerbaijan is a reliable and responsible member of the international community in the tackling the consequences of global climate change. Besides INDC, in November 2021, at the COP26 Conference, our country made a new commitment to reduce emissions by 40 percent by 2050 and to create a "net zero emission" zone in the liberated territories. The updated Nationally Determined Contribution (NDC 3.0) contain more ambitious target to reduce national greenhouse gas emissions up to 40% by 2035 compared to 1990 levels.

In this regard, Garabagh and East Zangezur regions liberated from occupation, as well as the Nakhchivan Autonomous Republic have been declared a "green energy" zone. Activities on environmental protection and restoration of the ecosystem have been identified as one of the primary goals in the process of restoration and reconstruction of liberated territories.

According to the Decree of President of the Republic of Azerbaijan Ilham Aliyev "On Measures Related to the Establishment of a Green Energy Zone in liberated territories of the Republic of Azerbaijan" dated May 3, 2021, the relevant Concept document has been developed in cooperation with Japan's "TEPSCO" and relevant measures have been taken in this field.

Stemming from the requirements of the aforementioned Concept, to date more than 1,500 individual residential houses, public and social buildings in the liberated territories have been equipped with solar panels with a total capacity exceeding 5,000 kW. In addition, more than 200 solar collectors, over 3,000 energy-efficient street lighting poles, 20 electric vehicle charging stations and “smart” parking facilities have been commissioned.

At the same time, the liberated territories possess very rich hydropower potential. For this purpose, “Azerenerji” OJSC has so far restored and installed 38 small hydropower plants with a total capacity of 307 MW in these areas. The work on the construction and operation of additional small hydropower plants will continue in the coming years. In 2024, these stations produced up to 550 million kilowatt-hours of environmentally clean “green energy”.

As an integral part of the sustainable strategy of the Nakhchivan Autonomous Republic, an international consulting company continues the work on the preparation of the “Green Energy Zone” Concept and Action Plan for Nakhchivan. The Concept aims to expand the use of renewable energy sources in Nakhchivan, ensure energy independence and sustainable development, establish modern grid infrastructure, increase energy export opportunities, and significantly reduce carbon emissions.

Currently, Azerbaijan's total electricity generation capacity is 9,732.5 MW, with the capacity of renewable energy, including major hydropower plants, of 1,829.6 MW, which accounts for 18.8% of the total capacity. By 2030, the main goal is to increase this figure to at least 30%.

A number of activities are underway to evaluate and realize the potential for electricity generation using renewable energy sources. By 2027, the country plans to implement green energy projects with a total installed capacity of over 2 GW. Since 2020, cooperation agreements have been signed with a number of international energy companies, including Masdar, ACWA Power, bp, SOCAR Green, Nobel Energy, AGEC, Baltech, Universal International, China Datang, China Energy, TotalEnergies, Elecnor, and Power China Resources.

On January 13, 2022, a groundbreaking ceremony was held for the 240 MW “Khizi-Absheron” Wind Power Plant. On October 26, 2023, the opening ceremony took place for the 230 MW “Garadagh” Solar PV Plant, the largest renewable energy station in the Caucasus and Caspian regions.

Within the framework of cooperation with Masdar, the implementation of green energy projects with a total capacity of 1,000 MW is ongoing. On 4 June 2024, the foundation was laid for the 445 MW Bilasuvar Solar Power Plant, the 315 MW Neftchala Solar Power Plant, and the 240 MW Absheron–Garadagh Wind Power Plant.

On December 17, 2022, the “Agreement on a Strategic Partnership in the field of Green Energy Development and Transmission between the Governments of the Republic of Azerbaijan, Georgia, Romania and Hungary” was signed in Bucharest.

Regular meetings of energy ministers have been held since the ninth Southern Gas Corridor Advisory Council Ministerial Meeting and the first Green Energy Advisory Council Ministerial Meeting. According to the agreement, green energy produced in the Caspian Sea will be exported to Europe through the “Caspian-Black Sea-Europe” Green Energy Corridor.

On February 3, 2023, the 9th Southern Gas Corridor Advisory Council Ministerial Meeting and the 1st Green Energy Advisory Council Ministerial Meeting were held in Baku.

On March 1, 2024, the 10th Southern Gas Corridor Advisory Council Ministerial Meeting and the 2nd Green Energy Advisory Council Ministerial Meeting were held in Baku. On December 11, 2023, the decision was made to hold the 29th session of the Conference of the Parties to the UN Framework Convention on Climate Change, COP29, in Azerbaijan on November 11-22, 2024. This is a clear example of the international community's great respect for and confidence in Azerbaijan.

Furthermore, the year 2024 has been declared the “Green World Solidarity Year” in the Republic of Azerbaijan by a decree of the President of the Republic of Azerbaijan dated December 25, 2023.

Within the framework of COP29, the solemn ceremony for the 240 MW “Shafag” Solar Power Plant was held in Jabrayil district.

In April of this year, the Government of the Republic of Azerbaijan signed Investment Agreements with “Enerso Jabrayil” LLC for the 50 MW “Ufug” Solar Power Plant and with “Clean Energy Jabrayil” LLC for the “Shams” Solar Power Plant projects. On October 28, 2025, President of the Republic of Azerbaijan Ilham Aliyev laid the foundation stones for the “Shams” and “Ufug” Solar Power Plants in Jabrayil district, each with a capacity of 50 MW.

During COP29, China’s Universal International Holdings Limited was announced as the winner of the first renewable energy auction for the construction of the 100 MW Gobustan Solar Power Plant. Construction of the 100 MW Gobustan Solar Power Plant is well underway.

A number of cooperation documents were signed with Chinese companies in the field of “green energy”. Within this framework, negotiations are underway with China Energy on a 160 MW solar power plant project, China Datang Overseas Investment Co. Ltd on a 100 MW solar power plant project, and Power China Resources on a 160 MW solar power plant project.

Several cooperation documents were also signed regarding the use of offshore wind energy potential.

In November 2024, a Memorandum of Understanding was signed with China Energy Overseas Investment Co., Ltd. to study offshore wind energy potential in the Caspian Sea. This envisages an initial 200 MW pilot project, with a total offshore wind energy project of 2 GW planned.

Within the framework of cooperation with Chinese companies, a Memorandum of Understanding was signed between the Ministry of Energy, SOCAR Green LLC, China Datang Overseas Investment Co. Ltd., and Power China Resources Limited on the development of a 2 GW offshore wind energy project in the Azerbaijani sector of the Caspian Sea. An initial 200 MW pilot project is planned as the first phase.

On 28 November 2025, an Implementation Agreement was signed between the Ministry of Energy and Clean Energy Capital LLC, a subsidiary of Azerbaijan Green Energy Company LLC, for the assessment, development, and implementation of an offshore wind energy project. Under the Implementation Agreement, the project is planned to be developed with a total capacity of 600 MW, including an initial phase of 200 MW.

On December 17, 2022, in Bucharest, the “Agreement on a strategic partnership in the field of green energy development and transmission between the Governments of the Republic of Azerbaijan, Georgia, Romania and Hungary” was signed. Under the Agreement, green energy produced in the Caspian Sea will be exported to Europe via the “Caspian–Black Sea–Europe” Green Energy Corridor.

To implement the Agreement, regular ministerial meetings were held, starting with the 9th Ministerial Meeting of the Southern Gas Corridor Advisory Council and the 1st Ministerial Meeting of the Green Energy Advisory Council. On April 4, 2025, the 11th Ministerial Meeting of the Southern Gas Corridor Advisory Council and the 3rd Ministerial Meeting of the Green Energy Advisory Council took place in Baku.

On November 13, 2024, the “Agreement between the governments of the Republic of Azerbaijan, Republic of Kazakhstan and Republic of Uzbekistan on Strategic Partnership in the Development and Transmission of Green Energy” was signed by the heads of state within the framework of COP29.

During COP29 in Baku (November 11–22, 2024) Azerbaijan presented three major energy initiatives: COP29 Global Energy Storage and Grids Pledge, COP29 Green Energy Pledge: Green Energy Zones and Corridors and COP29 Hydrogen Declaration.

The COP29 Global Energy Storage and Grids Pledge commits to deploying 1,500 GW of energy storage in the power sector by 2030, building or refurbishing 25 million kilometers of grids by 2030, and an additional 65 million kilometers by 2040.

The COP29 Green Energy Zones and Corridors Pledge envisages the creation of intercontinental and interregional green energy zones. The COP29 Hydrogen Declaration calls for

strengthening global efforts to increase clean hydrogen production and reduce carbon emissions from existing hydrogen production to net zero.

Azerbaijan's National Hydrogen Strategic Outlook has been completed, and the development of an Implementation Plan of the mentioned document is envisaged within the framework of the Social and Economic Development Strategy for 2027-2030 of the Republic of Azerbaijan. Announcement of Azerbaijan's National Hydrogen Strategic Outlook was held during the COP29.

A report on expanding the has been prepared. According to the report on potential for direct use of geothermal energy in Azerbaijan, Azerbaijan's initial geothermal thermal energy potential is estimated at 571.2 MW, and its electricity generation potential at 57.1 MW. The next stage involves the implementation of pilot projects. In order to expand the utilization potential of geothermal energy, Azerbaijan has been admitted to the Global Geothermal Alliance, managed by the International Renewable Energy Agency (IRENA), to foster collaboration with international organizations and learn from advanced global practices in this field. On the basis of the technical assignment documents on "Expansion of geothermal energy utilization opportunities" and "Expansion of bioenergy utilization opportunities", as well as for the identification of pilot projects in this field there have been involved consulting companies.

7.1.2 RENEWABLE ENERGY ENLARGEMENT POLICIES AND MEASURES

Azerbaijan's favorable geographical position and climatic conditions create vast opportunities for “green energy” production. Significant progress has been made in renewable energy generation through wind, solar, mountain rivers, biomass and geothermal water sources. The technical potential of our country's onshore renewable energy sources is 135 GW and offshore is 157 GW, where the 35 GW of the offshore capacity corresponds to shallow coastal areas and 122 GW to water basins (pools) with a depth greater than 50 meters. The economic potential of renewable energy sources is estimated at 27 GW, including 3 000 MW of wind energy, 23 000 MW of solar energy, 380 MW of bioenergy potential, 520 MW of mountain rivers.

The relevant state policy has been implemented in the direction of efficient use of these resources. The Presidential Order No. 1209, dated 29 May 2019 on accelerating reforms in the energy sector of the Republic of Azerbaijan formed the legal basis for liberalization, increased competition and the transition to green energy in the energy market. In this regard, the Law of the Republic of Azerbaijan No 339-VIQ, dated 31 May 2021 on the use of renewable energy sources in the production of electricity acts as an important regulatory framework governing the legal, economic and organizational foundations in this area, as well as support mechanisms for promoting green energy. Furthermore, the transition to green energy, enhancing energy efficiency and establishing low-carbon economy within the Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026 have been set as one of the main targets of national development.

Transforming these areas into a "green energy" zone is considered one of the main directions in the course of economic development determined by the territories liberated from occupation.

The relevant concept document was developed regarding establishment of the "green energy" zone in the liberated territories of the Republic of Azerbaijan. The purpose of the concept is to provide the area with green energy by using the high renewable energy potential available in the liberated territories and to formulate proposals by exploring the prospects of applying eco-friendly and energy-efficient green technologies. As part of the project, various scenarios for energy demand and supply have been reviewed, focusing on the development and settlement options for these territories. At the same time, continuous research was conducted in these regions to study the hydro, solar, wind, biomass, geothermal and other renewable energy potentials to build wind and solar power plants using existing resources, and also to construct hydropower plants in reservoirs and small rivers.

These regions have the potential of 7,200 megawatts of solar energy and 2,000 megawatts of wind energy. About 25% of the internal water resources of our country are formed in these territories. Solar energy potential is observed in Fuzuli, Jabrayil, Zangilan and Gubadli, while wind energy potential is mainly found in mountainous areas of Lachin and Kalbajar. The main rivers of the region such as Tartarchay, Bazarchay, Hakarichay and other small rivers have great hydropower potential. Furthermore, according to the preliminary analysis, it is assumed that there are 3093 cubic meters of thermal water reserves per day in Kalbajar

and 412 cubic meters per day in Shusha. Within the framework of establishing the Green Energy Zone, there are planned various measures such as electricity generation from renewable energy sources in the liberated territories, energy efficiency initiatives, the use of electric vehicles, the installation of renewable energy systems/grids (especially solar panels) on building rooftops, and the application of solar-powered LED lamps for street and road lighting, the use of renewable energy technologies in heating, cooling and hot water supply, as well as the introduction of smart energy management technologies and waste-to-energy management.

According to the Decree of the Cabinet of Ministers of the Republic of Azerbaijan dated June 21, 2022 "On the creation of the "green energy" zone in the liberated territories of the Republic of Azerbaijan within the framework of the Action Plan, state and private organizations dealing with the implementation of green technologies and energy efficiency requirements are expected to take appropriate measures in the liberated territories of the Republic of Azerbaijan in 2022-2026.

Moreover, during COP29, Azerbaijan, as a COP Presidency country, officially launched three important energy initiatives – COP29 Global Energy Storage and Grids Pledge, the COP29 Green Energy Pledge: Green Energy Zones and Corridors, and the COP29 Hydrogen Declaration. The wide application of renewable energy sources has been identified as one of the priorities of the energy policy of the country.

PROJECTS:

It is planned to implement additional green energy projects with a total capacity of more than 2 gigawatts by 2027. Among these projects, wind and solar plants implemented jointly with local and international partners are of particular importance:

Garadagh Solar Power Plant - On 26 October 2023, within the cooperation with the Masdar (UAE), the 230 MW Garadagh Solar Power Plant was put into operation as a pilot project. The plant was built with foreign investment worth 262 million USD. The plant will produce 500 million kilowatt-hours of electricity annually, saving 110 million cubic meters of natural gas. At the same time, carbon emissions into the atmosphere will be reduced by 188 Kt CO_2 eq.

Khizi-Absheron Wind Power Plant - The official opening ceremony of the 240 MW "Khizi-Absheron" Wind Power Plant, constructed by Saudi Arabia's ACWA Power, was held on January 8, 2026. Approximately USD 340 million in foreign investment was attracted to finance the project. The plant will produce 1 billion kWh of electricity annually, which will allow saving 220 million cubic meters of natural gas per year and preventing emissions of more than 375 Kt CO_2 eq. into the atmosphere.

Shafag (Sunrise) Solar Power Plant - The 240 MW Shafag SPP project is being implemented in Jabrayil region in cooperation with bp, SOCAR Green, MVM and ABDF. bp engaged the "Lightsource bp" company for the evaluation and construction works. Under the project, the land plot coordinates have been determined, topographic surveys have been conducted and relevant works are being carried out in the direction of studying connectivity options to the grid, as well as performing hydrometeorological analyzes and environmental impact assessments. The Azerbaijan National Agency for Mine Action has completely cleared the area designated for the implementation of the "Shafaq" solar power plant project of bp company. Using the virtual power transmission model, the electricity generated at the Shafag SPP will be transmitted to Azerenergy OJSC in Jabrayil, and an equivalent amount of electricity will be transmitted by Azerenergy OJSC to the Sangachal terminal in Baku via Virtual Power Transfer Arrangement (VPTA). This will allow for an approximately 50% reduction in emissions from terminal operations during the future operation of the Sangachal terminal. The annual average production of Shafag SPP is estimated to be around 500 million kWh. It means that 120-150 million cubic meters of natural gas will be saved annually, and up to 200 Kt CO_2 eq. emissions will be reduced. Construction work on the project is expected to continue until mid-2027. The project has got broad socio-economic impacts, such as local employment at the construction site, as well as green economy development of liberated lands.

Mega project - Within the framework of the Mega project implemented by Masdar, solar power plant with a capacity of 445 MW is being built in Bilasuvar region, solar power plant with a capacity of 315 MW in Neftchala region, and wind power plant with a capacity of 200 MW in Absheron and Garadagh regions. On 2 October 2025, the first solar panel was installed at the Bilasuvar SPP.

Gobustan Solar Power Plant - The Gobustan SPP with a capacity of 100 MW is being implemented by the China`s company - Universal International Holdings Limited, which won the auction in 2024. The plant is projected to generate about 260 million kWh of electricity annually. This will save 57 million cubic meters of natural gas and reduce up

to 100 Kt CO_2 eq. emissions into the atmosphere. The SPP is expected to be commissioned this year.

Ufug Solar Power Plant in Jabrayil - In April 2025, the Government of the Republic of Azerbaijan and Enerso Jabrayil LLC signed an Investment Agreement for the development of the 50 MW Ufug Solar Power Plant project. In June of the same year, the parties signed the Land Lease Agreement, Power Purchase Agreement (PPA), Grid Connection Agreement, and Balancing Agreement. In October 2025, the foundation of the power plant was laid in Shahvalli village of the Jabrayil district. The plant is expected to generate 110 million kWh of electricity annually, resulting in annual savings of 22 million cubic meters of natural gas and a reduction of 41 Kt CO_2 eq. emissions.

Shams Solar Power Plant Project in Jabrayil - In April 2025, the Government of the Republic of Azerbaijan and Clean Energy Jabrayil LLC signed an Investment Agreement for the 50 MW Shams Solar Power Plant project. In June of the same year, Clean Energy Jabrayil LLC signed the Land Lease Agreement, Power Purchase Agreement (PPA), Grid Connection Agreement, and Balancing Agreement. In October 2025, the foundation stone for the 50 MW Shams Solar Power Plant was laid in Shahvalli village of the Jabrayil district. The plant is expected to generate 102 million kWh of electricity annually, resulting in annual savings of 20 million cubic metres of natural gas and a reduction of 44 Kt CO_2 eq. emissions.

Shams 1 Solar Power Plant in the Nakhchivan Autonomous Republic - In February 2026, the Government of the Republic of Azerbaijan, Azerenergy OJSC, and CEI Nakhchivan LLC signed the Investment Agreement, Power Purchase Agreement (PPA), and Grid Connection Agreement for the 25 MW Shams 1 Solar Power Plant project in the Nakhchivan Autonomous Republic.

The installation of 10 MW of solar panels has already been completed by CEI Nakhchivan LLC. Construction and installation works are scheduled to be completed in November this year. The plant will be commissioned once the network infrastructure is fully completed. Currently, 218 workers are engaged in the implementation of the project.

Following its commissioning, the plant is expected to generate approximately 57 million kilowatt-hours of electricity annually and supply energy to nearly 19,000 households. As a result, about 26 Kt CO_2 eq. emissions will be prevented annually, while 12 million cubic meters of natural gas will be saved.

Garbi Ufug Solar Power Plant in the Nakhchivan Autonomous Republic - In February 2026, the government of the Republic of Azerbaijan, “Azerenergy” OJSC and “Enerso” LLC signed the Investment Agreement, Power Purchase Agreement (PPA), and Grid

Connection Agreement for the 25 MW Garbi Ufug Solar Power Plant project. Topographic works related to the construction of the plant by "Enerso" LLC have already been completed, while geological survey works are ongoing. Construction is scheduled to begin by the end of this year. The project is planned to be implemented across a 50-hectare area designated for renewable energy projects. Following its commissioning, the plant is expected to generate approximately 61 million kilowatt-hours of electricity annually, supplying energy to nearly 21,000 households. It is also projected to prevent about 26,000 tons of carbon dioxide emissions annually and save 12 million cubic meters of natural gas.

Floating solar panels project - On July 29, 2024, the opening ceremony of a 100-kW photovoltaic system on Boyukshor Lake (Baku) was held within the pilot project Knowledge exchange and technical assistance support for the development of floating solar panels system, implemented with the support of the Asian Development Bank. The experimental facility is the first solar power plant in the country to be commissioned over a watershed. Within the pilot project, it is planned to develop business models and strengthen national potential through trainings in order to promote the participation of the private sector in the installation of solar facilities. Studies are being conducted to implement large-scale projects on water bodies in the future.

Cooperation with Chinese Companies:

1. EPPEI

On June 2, 2025, the Ministry of Energy of the Republic of Azerbaijan and China Energy Engineering Corporation Limited signed an Agreement on Comprehensive Strategic Partnership in the Energy Sector.

Pursuant to the Agreement, on June 27, 2025, the Ministry of Energy of the Republic of Azerbaijan and the Electric Power Planning and Engineering Institute (EPPEI) of the People's Republic of China signed an agreement on the "Study of Azerbaijan's Electric Power Transmission Network."

On April 6, 2026, the Ministry of Energy of the Republic of Azerbaijan and EPPEI signed a procurement contract for the provision of services for the preparation of a feasibility study for the Study of Azerbaijan's Electric Power Transmission Network. Regular online and in-person technical meetings have been held as part of the project. The project is scheduled to be completed on December 1, 2026. EPPEI has prepared documents covering the key input data and methodological approaches for the PLEXOS and DIgSILENT models, which have been agreed upon with AzerEnerji OJSC. The studies are planned to be carried out in accordance with these documents.

2. China Datang Co. Ltd

On November 14, 2024, the Ministry of Energy of the Republic of Azerbaijan and China Datang Corporation Limited signed a Memorandum of Understanding on the development of renewable energy projects in Azerbaijan. On November 12, 2025, the Ministry of Energy, China Datang Overseas Investment Co. Ltd, and SOCAR Green LLC signed an Implementation Agreement on the assessment, development, and implementation of a 100 MW Solar Power Plant Project in the Republic of Azerbaijan.

3. PowerChina Resources Group

On November 18, 2024, the Ministry of Energy of the Republic of Azerbaijan and PowerChina Resources Limited signed a Memorandum of Understanding on the development of renewable energy projects in the Republic of Azerbaijan.

On April 21, 2025, the Ministry of Energy, PowerChina Resources Limited, and SOCAR Green LLC signed an Implementation Agreement on the assessment, development, and implementation of a 160 MW Solar Power Plant Project. By Resolution No. 177 of the Cabinet of Ministers of the Republic of Azerbaijan dated June 12, 2026, a 320-hectare plot of land in the Hajigabul district was designated as a renewable energy zone for the construction of the 160 MW Solar Power Plant.

On April 22, 2025, the Ministry of Energy, SOCAR Green LLC, China Datang Overseas Investment Co. Ltd, and PowerChina Resources Limited signed a Memorandum of Understanding on the development of a 2 GW offshore wind energy project in the Azerbaijani sector of the Caspian Sea.

Green Energy Corridors:

1. Caspian–Black Sea–Europe

Concerning green energy corridors, on 17 December 2022, the Agreement on Strategic Partnership in the Development and Transmission of Green Energy between the Governments of the Republic of Azerbaijan, Georgia, Romania and Hungary (Caspian–Black Sea–Europe Green Energy Corridor) was signed in Bucharest. The Agreement is expected to contribute to the energy security of the European Union. Green Energy

Corridor Power Company (GECO Power Company) was established to carry out project management with the participation of the transmission system operators of the four countries.

The Agreement emphasizes investments in green energy generation capacity, particularly renewable energy, cooperation in the development of Long-Term Low-CarbonDevelopment Strategies, and the implementation of measures in the fields of renewable and clean energy, as well as green hydrogen production, transportation and trade, energy efficiency and decarbonization. These efforts are aimed at achieving rapid, substantial and sustainable reductions in greenhouse gas emissions by 2030, in line with the targets set under the Paris Agreement.

In terms of the project's integration into European electricity network planning, GECO Power Company submitted an application to the TYNDP (Ten-Year Network Development Plan) process in 2026. Following the application, the project was included in the initial list of electricity infrastructure projects to be assessed under ENTSO-E's upcoming TYNDP. Subsequently, Phase 1 and Phase 2 of the Caspian–Black Sea–Europe Green Energy Corridor were included in the TYNDP 2026 project portfolio.

Furthermore, at the 12th meeting of the Ministerial/Steering Committee, held in Baku on 8 July 2026, it was confirmed that work on Tasks 6, 7, 8 and 9 of the project's Feasibility Study had been completed. Accordingly, the project formally moved to the post-Feasibility Study development phase, marking an important step towards its further development and implementation.

2. Central Asia–Azerbaijan

On 13 November 2024, the “Agreement on Strategic Partnership in the Development and Transmission of Green Energy between the Governments of the Republic of Azerbaijan, the Republic of Kazakhstan and the Republic of Uzbekistan” was signed by the Heads of State of the three countries on the sidelines of COP29. To implement the Agreement, on 27 December 2024, the Green Corridor Union Alliance Joint Venture was established in Baku by Azerenergy OJSC, Kazakhstan Electricity Grid Operating Company (KEGOC) and National Power Grid of Uzbekistan JSC.

Within the framework of the project, a Memorandum of Understanding (MoU) was signed between the Ministries of Energy of the three countries and the Asian Development Bank (ADB) and the Asian Infrastructure Investment Bank (AIIB). Following an international tender for the preparation of the project's Feasibility Study (FS), the Italian

company CESI S.p.A. was selected as the successful bidder. The completion of the Feasibility Study is planned for May 2027.

To support the preparation of the first phase of the Feasibility Study, the Asian Development Bank has provided technical assistance in the amount of USD 1 million. Meanwhile, documentation is being processed by the Asian Infrastructure Investment Bank towards providing a similar financial contribution. Within this framework, the project will assess its technical and economic parameters, as well as the potential for connecting the renewable energy resources of Central Asia to regional and, in the longer term, European energy markets through Azerbaijan.

3. Azerbaijan–Georgia–Türkiye–Bulgaria

The 1st Ministerial Meeting on the project was held in Istanbul on 22 November 2024, followed by the 2nd Ministerial Meeting in Baku on 4 April 2025, and the 3rd Ministerial Meeting in Istanbul on 22 May 2026. During the 2nd Ministerial Meeting, a Memorandum of Understanding (MoU) on the transmission and trade of green electricity was signed between the Ministry of Energy of the Republic of Azerbaijan, the Ministry of Energy and Natural Resources of the Republic of Türkiye, the Ministry of Energy of the Republic of Bulgaria, and the Ministry of Economy and Sustainable Development of Georgia. A work schedule outlining the activities to be carried out under the project was also approved. Taking into account the interest expressed by Romania in joining the project, the Turkish side prepared a draft Protocol on amendments to the MoU signed on 4 April 2025, which was subsequently submitted to the relevant parties for consideration.

During the 3rd Ministerial Meeting, the participating parties agreed on the establishment of a Joint Venture (JV). In accordance with this decision, the Turkish side prepared a draft Shareholders' Agreement for the establishment of the JV and submitted it to the participating parties for review.

In July 2026, the draft Intergovernmental Agreement (IGA) for the project was developed in Baku and is currently undergoing coordination with the relevant domestic and foreign authorities. The signing of the Shareholders' Agreement is also planned.

Furthermore, the project's Terms of Reference (ToR) have been prepared and agreed upon by the participating parties. In order to accelerate the implementation process, the parties agreed to prepare a Roadmap covering the necessary measures within a short period of time.

During the Ministerial Meeting, the parties also agreed on the preparation of the Intergovernmental Agreement. In this regard, the Azerbaijani side prepared the draft IGA and submitted it to the participating parties for consideration.

4. Azerbaijan-Türkiye-Europe

A Memorandum of Understanding (MoU) on cooperation in the transmission of electricity generated from renewable energy sources in Azerbaijan and Türkiye was signed between the Ministry of Energy of the Republic of Azerbaijan and the Ministry of Energy and Natural Resources of the Republic of Türkiye. Work is currently underway to integrate the energy infrastructures of Azerbaijan and Türkiye and to facilitate electricity exports through Nakhchivan. In addition to the planned export of 1 GW of renewable energy from Nakhchivan, the proposed transmission infrastructure has the potential to enable the transmission of electricity from the Caspian Sea region and Central Asia to Türkiye and Europe.

In this regard, the Jabrayil substation, with a voltage level of 330/110/10 kV and a capacity of 2×250 MVA, has been commissioned as part of the establishment of the Jabrayil energy hub. It is planned to construct a 330 kV transmission line connecting the Jabrayil energy hub to Nakhchivan via either the Zangezur corridor through the territory of Armenia or through the territory of Iran, as well as to construct a 330 kV substation in Nakhchivan.

5. Azerbaijan-Georgia-Türkiye-Bulgaria

Memorandum of Understanding on cooperation in the field of green electricity transmission and trade (**Azerbaijan-Georgia-Türkiye-Bulgaria Green Energy Corridor)** was signed between the Ministry of Energy of the Republic of Azerbaijan, the Ministry of Economy and Sustainable Development of Georgia, the Ministry of Energy and Natural Resources of the Republic of Türkiye and the Ministry of Energy of the Republic of Bulgaria on 4 April 2025.[48]

Offshore wind

[48] https://minenergy.gov.az/en

Between the Ministry of Energy of Azerbaijan, SOCAR Green LLC, China Datang Overseas Investment Co. Ltd and Power China Resources Limited there was signed a Memorandum of Understanding on the development of an offshore wind energy project with a capacity of 2 GW in the Azerbaijani sector of the Caspian Sea. Within the Memorandum, cooperation will be carried out on the assessment of investment opportunities and the establishment of appropriate technical and legal support mechanisms.

Ministry of Energy and Clean Energy Capital, a subsidiary of Azerbaijan Green Energy Company, have signed an implementation agreement for the assessment, development, and execution of an offshore wind energy project. The project envisions a total capacity of 600 MW, with an initial phase of 200 MW. In accordance with the Execution Agreement, the wind measurement campaign in the Caspian Sea has already commenced.

By Resolution No. 251 of the Cabinet of Ministers of the Republic of Azerbaijan dated July 31, 2026, a water area with a total area of 711.4 square kilometers, located in the sector of the Caspian Sea (lake) belonging to the Republic of Azerbaijan, was designated as a renewable energy zone for the construction of offshore wind power plants.

Hydrogen

The country report on the Low carbon hydrogen economy market research was prepared by the international consulting company with the support of the European Bank for Reconstruction and Development (EBRD) to assess the production capabilities of green and blue hydrogen types in Azerbaijan, their use in the domestic market, as well as the technical capabilities and economic efficiency of their export.

In the results of the market research, it was suggested that green hydrogen production is economically efficient, as well as export to regional energy markets and application areas for domestic consumption. The report provides information on future steps, areas where green hydrogen can be consumed in the domestic market, the Levelized Cost of Hydrogen (LCOH), export routes and other issues.

Azerbaijan's National Strategic Outlook for Hydrogen, reflecting a unified approach in the field of low-carbon hydrogen production, was prepared and presented within the COP29 conference. Currently, work is underway on the preparation of implementation plan of strategic outlook.

Green Energy Zone

Regarding the green zones' establishment, in accordance with the Presidential Order No. 2620 of 3 May 2021, on Measures Related to the Establishment of a Green Energy Zone in the Liberated Territories of the Republic of Azerbaijan, a Green Energy Zone Concept was developed with the involvement of the Japanese company TEPSCO. The principles set out in the Concept are currently being implemented across the liberated territories. To date, solar panels with a total installed capacity of more than 8 MW have been installed in over 2,500 private houses, public buildings and social facilities, alongside more than 8,000 LED-based lighting units, with implementation continuing in line with the resettlement plans. Approximately 43% of these lighting units (around 3,500) are solar-powered hybrid systems. Currently, 38 hydropower plants with a combined installed capacity of 307 MW are in operation in the liberated territories, while the construction of 11 additional hydropower plants with a total capacity of 48.5 MW is underway. The 240 MW Shafag Solar Power Plant, 50 MW Ufug Solar Power Plant, and 50 MW Shams Solar Power Plant projects are being implemented in the Jabrayil district. Within the State Programme on the Socio-Economic Development of the Nakhchivan Autonomous Republic for 2023–2027, a Concept and Action Plan for the establishment of a Green Energy Zone has been developed. The 50 MW Shams 1 Solar Power Plant and Garbi Ufug Solar Power Plant projects are currently under implementation.

7.1.2.1 Some concrete mitigation measures on renewable energy enlargement and electrification, their impacts assessment

1. Electricity Generation at Hydropower Plants in the Karabakh and East Zangezur regions of Azerbaijan

Objective. Reduction of emissions through electricity generated from renewable energy sources in "Green Energy Zones".

Responsible organization, implementing body, and coordination issues is "Azerenerji" JSC

Description. Since 2022, 38 HPPs with a total capacity of 307 MW have been built or renovated.

In this regard, it should be noted that the hydropower potential of the liberated territories is estimated to be approximately 550 MW. The "I State Program for the Great Return to the Liberated Territories of the Republic of Azerbaijan" outlines the restoration of 23 small hydropower stations and the construction of 37 new ones by 2026. In order to efficiently utilize the hydropower potential of the liberated territories through public-private partnerships, fruitful relation was stablished between "Azerbaijan Investment Company" and "Arges Energy Team" (Türkiye) for the restoration and reconstruction of small hydropower stations and appropriate measures have been taken.

"Azerbaijan Investment Company" OJSC has announced an investment competition for the construction of 10 small hydropower stations (SHPS) with a total installed capacity of 39.5 MW in Kalbajar and Lachin districts. On December 27, 2023, "Azerbaijan Investment Company" OJSC signed a Joint Participation Agreement with Turkish companies "Demirören Yatırım Holding A.Ş." Group of Companies and "Arges Enerji Team" LLC for the purpose of restoration and operation of 5 small hydropower stations with a capacity of 13.8 MW in Kalbajar and Lachin districts.

In 2024 fourteen hydropower stations with a total capacity of 90.1 MW were operating in the liberated territories and the Aghbulag station, with an installed capacity of 14.25 MW, was in test operation. Construction and installation works have been finished at 12 stations with a total capacity of 104.8 MW. Of these, 3 stations with a total capacity of 31.5 MW are being reconstructed. Restoration and construction work continue at 5 stations with a total capacity of 29.3 MW, including the decommissioned Zabukh station.

On May 27, 2023, small hydropower stations "Meydan", with a capacity of 3.4 MW, and "Gamishli", with a capacity of 6.3 MW, were put into operation after reconstruction in the territory of Kalbajar district. On August 25, 2023, the 5.3 MW Soyugbulag, 8.3 MW Chirag-1 and 3.6 MW Chirag-2 small hydropower stations were commissioned in Kalbajar district after reconstruction.

In the administrative territory of Kalbajar district, the reconstruction of "Zar" SHPS with a capacity of 4.3 MW and the construction of 3 hydroelectric power stations with a total capacity of 39.9 MW ("Yukhari Vang" with a capacity of 8.6 MW, "Ashaghi Vang" with a capacity of 22.5

MW and "Nadirkhanlı" with a capacity of 8.8 MW) have been started. The reconstruction works of 6 MW "Alkhasli" and 8.25 MW "Mishni" power stations in Lachin district have been completed and put into operation on August 25, 2023. In Lachin district, there are being carried out reconstruction works of small hydropower stations "Mirik" with a capacity of 3.5 MW, "Zabukh" with a capacity of 2.8 MW, "Garagishlag" with a capacity of 4.0 MW and "Aghbulag 1" with a capacity of 14.7 MW. Moreover, on May 2023, two substations were commissioned: the "Lachin City" substation with a capacity of 2x40 MVA and the "Gorchu" digital hub substation with a capacity of 2x25 MVA (110/35/10 kV). At the same time, 110 kV power transmission lines were built between these stations, forming a circular power supply system. To connect the exist-ing 110 kV "Gubadli SS-Jabrayil SS" OPTL to the 330/110 kV "Jabrayil" substation, the construction of a 24 km double-circuit line has been completed.

The construction works of 4 small hydropower stations with a total capacity of 42 MW ("Shayifli", "Sarigishlag", "Zangilan" and "Jahangirbayli" with a capacity of 10.5 MW each) have been completed in Zangilan district. On September 28, 2023, "Jahangirbayli" SHPS was put into operation. The construction of the 4.1 MW "Toghanali" SHPS has also begun in the administrative territory of Goygol district. Thus, 38 HPPs with a total capacity of 307 MW have been built or renovated since 2022. Currently, 8 HPPs with a total capacity of 38.5 MW are under construction. In the future, it is planned to build new small HPPs with a total capacity of 160 MW in the Karabakh and East Zangezur regions by 2030.

Besides that, 35/0.4 kV "Zangilan" substation and Digital Management Center have been constructed in Zangilan city. In Shusha city and in the districts of Fuzuli, Jabrayil, Khojavand, Zangilan, Gubadli and Aghdam, repair and restoration works have been carried out on 40.5 km of 35 kV, 72.3 km of 10 kV, and 34.2 km of 0.4 kV power supply lines, including 11 units of 35 kV and 82 units of 10 kV substations. There have been laid 100 km long lines using 35 kV self-supporting insulated wires for the electricity supply of special facilities in the directions of Zod, Alagollar, Istisu, Zar, Marjimak, Yellija and Aghgaya villages in Kalbajar district and Bozlu and Minkand settlements in Lachin district, as well as 35/0.4 kV-11 complete transformer substations have been installed. The construction of Digital Control Centers in Aghdam, Kalbajar and Gubadli districts, as well as 110/35/10 kV "Istisu" and two 35/0.4 kV substations in Aghdam district is ongoing. Also, there have been established Digital Substation and Control Center in Fuzuli, a Junction

Substation and Digital Control Center in Hadrut, an Innovative Technology Center for Electric Networks in Shusha and Digital Control Center in Jabrayil.

Moreover, on 19.05.2024 "Khudafarin" hydroelectric complex on Araz River was commissioned and Giz Galasi" hydroelectric complex was inaugurated with participation of Mr. Ilham Aliyev, the President of the Republic of Azerbaijan and Mr. S.E.Raisi, the President of Iran.

Moreover, with the financial support of the World Bank, the "Studying and strengthening of the grid" project has been implemented in Azerbaijan. The aim of this project was to facilitate the transmission of electricity generated from renewable energy sources into the grid, conduct assessments and relevant analyses and prepare related reports.

At the same time, TETRA TECH and EPRA, which are technical consultants of "Masdar" and "Azerenergy" OJSC, conducted researches to determine the potential integration capacities of solar and wind power plants into the energy system of Azerbaijan.

Emission reduction effect (in CO2 eq.): As of today, the production of hydroelectric power plants in the Karabakh and East Zangezur regions alone has prevented the emission of 650 Kt CO_2 eq. emissions into the atmosphere since 2022.

Electricity generated by hydroelectric power plants reduces natural gas combustion in conventional thermal power plants, thereby avoiding greenhouse gas emissions into the atmosphere and enabling to export additional volumes of gases to EU and other regions. According to current generation figures, 528 million kWh of renewable electricity is produced annually. This prevents the emission of approximately 200 Kt CO_2 eq. emissions into the atmosphere annually. In the close future, the annual production is targeted to reach 1 billion kWh. This, in turn, will result in a reduction of greenhouse gases equivalent to approximately 450 Kt CO_2 eq. emissions per year.

Other socio-economic and international cooperation contributions including SDGs implementation - creation of new jobs; increasing the share of renewable energy sources in the country's total generation capacity; expanding prospects for future export of green energy through the western corridors, as well as income generation through expanding gas export to EU and other countries and contribution to the energy security of EU.

2. Implementation of 250 MW/500 MWh Battery Energy Storage Systems (BESS)

Objective. Integration of energy produced from renewable energy sources into the overall grid system in a flexible and sustainable manner and provision of the frequency regulation during the integration

Responsible organization, implementing body, and coordination issues is "Azerenerji" JSC.

Description. Electricity generated 100% from renewable energy sources (wind, solar) is being integrated into the grid in a flexible and sustainable manner.

One of the BESSs (Battery Energy Storage Systems) was built on the territory of the existing 500/330/220/10 kV Absheron substation, and the other was built on the territory of the 220/110/10 kV Agdash substation. Moreover, 2 BESSs with a capacity of 125MW/250MWh have been built and put into operation in the energy system.

On March 25, 2026, President of the Republic of Azerbaijan Ilham Aliyev attended the inauguration of the "Absheron" Battery Energy Storage Center of the "AzerEnergy" Open Joint-Stock Company.

In the future, it is planned to build another BESS with a capacity of 150MW/300MWh in the territory of the Navahi substation.

Emission reduction effect (in CO2 eq.): As a result of the measures taken, the emission of greenhouse gases equivalent to CO2 into the atmosphere is prevented. Due to the electricity produced by wind and solar power plants, natural gas fuel is not burned in the traditional power plants, thereby preventing the emission of greenhouse gases into the atmosphere. Based on current generation figures, 723 million kWh of renewable electricity is generated annually. This prevents the emission of approximately 272 thousand tons of greenhouse gases in CO2 equivalent into the atmosphere each year. In the close future, the annual production is targeted to exceed 2 billion kWh. This, in turn, will result in a reduction of greenhouse gases by approximately 850 Kt CO_2 eq. emissions per year.

Other socio-economic and international cooperation contributions including SDGs implementation - creation of new jobs; increasing the share of renewable energy sources in the country's total generation capacity; effective and flexible transmission of wind and solar energy to the grid.

3. Expansion of the use of renewable energy sources at the "Azerbaijan Airlines" CJSC (AZAL)

Objective – Enlargement use of electricity produced through the renewable energy sources

Responsible organization, implementing body, and coordination issues is "**Azerbaijan Airlines" CJSC (AZAL).**

***Description*.** Increasing the share of renewable energy and reducing indirect CO_2 emissions associated with electricity consumption through the implementation of the 2 MW Solar Carport Project at Heydar Aliyev International Airport and the 15 MW "Shams" Solar Power Plant Project. The 2 MW Solar Carport Project at Heydar Aliyev International Airport is planned to be implemented by 2027, while the 15 MW "Shams" Solar Power Plant Project is planned to be implemented in 2028. Full integration of the projects into the energy system is expected to be completed by 2029.

***Emission reduction effect (in CO2 eq*.):** The measure is aimed at reducing **indirect CO_2 emissions associated with electricity consumption.** As a result of implementing the **2 MW Solar Carport** and **15 MW "Shams" Solar Power Plant** projects, AZAL's CO_2 emissions associated with electricity consumption are expected to decrease by approximately **50% by 2029.** Overall emissions of AZAL were 1033 tons of CO_2 eq. in 2024.[49] Therefore, the expected emission reduction would be 516.5 tons of CO_2 eq. by 2029.

Other socio-economic and international cooperation contributions including SDGs implementation - Planning, technical assessment, and preparatory activities are currently underway for the **2 MW Solar Carport** and **15 MW "Shams" Solar Power Plant** projects. Technical and organizational arrangements for integrating the projects into AZAL's energy supply system are being developed, having a positive impact on reducing **noise and other local air pollutants.** Moreover, a Memorandum of Understanding has been signed between the Ministry of Energy and Fortescue Future Indus-tries of Australia. This Framework Agreement on joint cooperation for studying and developing renewable energy projects and the potential of "green hydrogen" in Azerbaijan envisages to explore and implement projects with a total capacity of up to 12 GW on the production of renewable energy and "green hydrogen" in Azerbaijan.

4. **Electrification of Sangachal terminal, aiming for power switch from gas turbines to national electricity grid implemented by *bp***

***Objective*:** Operating bp Sangachal oil and gas terminal on electricity frees up certain volumes of natural gas to be sold on national or international market.

Responsible organization: bp

Description: Electric infrastructure (substation, high voltage lines, etc.) are in active construction as of summer 2026, permanent change of energy supply is expected closer to end of 2027. Switching off gas turbines will reduce on -site generation of direct (Scope1) emissions of CO2, CH4. These will be replaced by indirect (Scope 2) emissions of CO2 attributable to the share of gas-powered powers stations of the national grid.

[49] https://www.azal.az/_next/static/media/pdf/ENG_Azerbaijan_Airlines_Sustainability_Report_2024_.pdf

Emission reduction effect (in CO2 eq.): the final reduction volume will be assessed once the project is delivered and ST is connected to the power grid by the end of 2027.

Other socio-economic and international cooperation contributions including SDGs implementation: Local employment at the construction, as well as possibility of getting solar-produced electricity from the above-mentioned "Shafaq" (Sunrise) project in Jabrayil region of Azerbaijan.

5. Flagship projects by SOCAR Green. Actually, SOCAR Green develops six Utility-Scale Projects and six Early-Stage Utility-Scale Projects including onshore hybrid and offshore wind technologies, complimented by C&I initiatives, as well as emerging technologies and potential geographical expansion opportunities:

Mega Project (SOCAR Green and Masdar): 315 MW Solar PV Neftchala; 445 MW Solar PV Bilasuvar. Total investment exceeding USD 600 million, financed by EBRD, ADB, and AIIB; 200 MW Onshore Wind Absheron-Garadagh

Shafag Solar PV Plant (bp, SOCAR Green, MVM, ABDF): 240 MW "Shafag" Solar PV Jabrayil, supplying clean electricity to the Sangachal terminal via a Virtual Power Transfer Arrangement (VPTA)

Hajigabul Solar PV Plant (SOCAR Green and China Energy Overseas Investment Co.)**:** 160 MW Solar PV project and technical cooperation on up to 3 GW of offshore wind, including a 200 MW pilot in the Caspian Sea.

Offshore Wind Project (China Datang Overseas Investment Co. & PowerChina Resources Ltd.): Co-development of up to 2 GW of offshore wind, including a 200 MW pilot in the Caspian Sea.

Aran Solar PV Plant (SOCAR Green and PowerChina Resources Ltd.): Joint development of a 160 MW Solar PV project

Energy Efficiency Project (SOCAR Green; Azerbaijan State Water Resources Agency (ASWRA): Energy efficiency improvements across ADSEA's operational facilities and development of a 120 MW renewable energy power plant operating under a long-term clean electricity offtake framework

Geothermal Energy Development: SOCAR Green is advancing geothermal energy development in Azerbaijan through initial studies conducted with international partners. Assessments have identified promising resources for both electricity generation and district heating, with ongoing evaluation across the regions of Kalbajar, Central Aran, Masalli, and Lankaran.

7.1.3 ENERGY EFFICIENCY POLICES AND MEASURES

The energy efficiency policy of our country began to be implemented in 1996 with the adoption of the Law of the Republic of Azerbaijan “On the use of energy resources”. This law determines the fundamental principles of state policy and the main directions of state regulation in the field of energy resources use and outlines the activities of the relevant executive authority on the use of energy resources. To achieve the goal specified in the development concept “Azerbaijan 2020: Vision for the future” approved by Decree No. 2918 of the President of the Republic of Azerbaijan dated May 29, 2013, highlights the effective state regulation that ensures healthy competition in a market economy, as well as the principles of a comprehensive approach to the transition into a high-value-added export-focused economy, which uses energy efficiently, and development of socio-economic sectors. The country's energy efficiency policy is further defined in the "Strategic Roadmap for the Development of Communal Services" (electricity, thermal energy, water and gas) approved by the Decree of the President of the Azerbaijan Republic dated December 6, 2016. The document encompasses the strategic vision until 2020, a long-term perspective for the period until 2025 and target goals for the period after 2025.

Municipalities that have signed the agreement based on the Covenant of Mayors, coordinated by the Ministry of Energy on the initiative of the EU, are at different stages of developing their Sustainable Energy and Climate Action Plans (SECAP).

With the support of the International Energy Charter (İEC), the Ministry of Energy of the Republic of Azerbaijan prepared a draft law on "Rational use of energy resources and energy efficiency" in order to determine the basis of the state policy in the field of energy efficiency and efficient use of energy resources within the framework of the Eu4Energy project, and it was adopted on July 9, 2021. Within the implementation of the mitigation measures the draft of the “National Action Plan on Energy Efficiency of the Republic of Azerbaijan" was prepared with the support of the Secretariat of the International Energy Charter (IEC).

7.1.3.1 Some concrete mitigation measures on energy efficiency and their impact assessment

Here below there are collected some concrete mitigation measures on energy efficiency:

1. **Commissioning of the "8 Noyabr" Power Plant (**Mingachevir) **with a capacity of 1,880 MW**

Objective. To replace the outdated power plant with low energy efficiency and high emissions with a modern and energy efficient conventional power plant integrated to the national power grid

Responsible organization, implementing body, and coordination issues is **"Azerenerji" OJSC**

Description. The '8 Noyabr' Power Plant was constructed in the base of the existing outdated "Azerbaijan" Thermal Power Plant in the city Mingachevir (Azerbaijan), the mitigation measure has started in October 2022 on the base of, by order of head of state, stating to construct a new station on the territory of the Azerbaijan Thermal Power Plant. In February 2023, the construction phase of the station began and In June 2025 the official opening ceremony of the station took place signing implementation of the mitigation measure.

Emission reduction effect (in CO2 eq.): As a result of the measures, the huge amount of GHG emissions is prevented. So, compared to the previous "Azerbaijan" TPP, the "8 November" station consumes 110 g/kW less of the conventional fuel (natural gas) in comparison to the previous TPP and therefore annually saves approximately 1 billion m^3 of the fuel and prevents approximately 2,095 million tons of CO_2 equivalent GHG emissions into the atmosphere, during annual generation of appr. 12 billion kWh of electricity.

Other socio-economic and international cooperation contributions including SDGs implementation – reducing air **pollution,** creation of new jobs; expanding prospects for future export of green energy through the western corridors, as well as income generation through expanding gas export to EU and other countries and contribution to the energy security of EU.

2. **Enhancement of energy efficiency at Heydar Aliyev International Airport**.

***Objective*:** Reduction of energy consumption and associated indirect CO_2 emissions through the implementation of LED lighting systems, modernization of electrical infrastructure, and other energy-efficiency measures.

Responsible organization, implementing body, and coordination issues is **Azerbaijan Airlines CJSC**

Description. The mitigation measure targets increasing **energy efficiency of the mentioned airport infrastructure** at **Heydar Aliyev International Airport in Baku.** The project started in 2025 and is **currently being implemented.** Some stages of the mitigation measure related to modernization of LED lighting systems and improving electrical

infrastructure at Heydar Aliyev International Airport have been implemented, while additional energy-efficiency measures continue to be carried out.

Emission reduction effect (in CO2 eq.): The measure is aimed at reducing **indirect CO_2 emissions associated with energy consumption.** As a result of LED modernization, improvements to electrical infrastructure, and other energy-efficiency measures, CO_2 emissions are annually expected to decrease by approximately **5–10%,** i.e. 51.65-103.3 tons CO_2 eq. emissions per year.

Other socio-economic and international cooperation contributions including SDGs implementation - the mitigation measure has resulted in improvements in energy efficiency, having a positive impact on reducing **local air pollution.** The measure could enable saving some financial resources **of Azerbaijan Airlines CJSC** which could be used for the social protection projects.

3. SOCAR's "Decarbonization Action Plan for 2022–2050".

***Objective*:** are to ensure the efficient use of energy and other resources, optimize operational processes, and reduce energy intensity and greenhouse gas emissions.

***Responsible** organization,* implementing body, and coordination issues is **SOCAR**.

Description. SOCAR's "Decarbonization Action Plan for 2022–2050" has been approved and presented during COP28 held in Dubai in December 2023. The optimization and emission reduction measures envisaged under the Plan cover all areas of SOCAR's operations.

Measures are being implemented to reduce GHG emissions through the optimization of existing operational processes and technological regimes, reduction of energy consumption, improvement of equipment efficiency, minimization of process losses, and application of energy efficiency solutions in new projects. The optimization measures cover all areas of SOCAR's operations and are aimed at improving energy and emissions performance across production, processing, transportation, and other operational activities.

In parallel, measures for the monitoring and reduction of methane emissions primarily cover oil and gas production and transportation activities, including the Upstream and Midstream segments.

Methane emissions are being detected, measured, and monitored at SOCAR's production facilities located in various areas of the Republic of Azerbaijan over 2026. Within the Upstream segment, monitoring activities are carried out at both onshore and offshore facilities, while within the Midstream segment, monitoring is conducted at relevant assets located in various regions of the country.

Modern sensor technologies, including drone-based measurement and monitoring systems, are used to identify methane emissions. Identified emission sources are measured and assessed, and repair and corrective measures, including **Leak Detection**

and Repair (LDAR), are implemented to address identified leaks. Following the completion of repair activities, follow-up monitoring is conducted to verify the effectiveness of the measures taken. The data collected are systematized and analyzed and used to improve the inventory, monitoring, and reporting of SOCAR's methane emissions.

The optimization, energy efficiency, and methane emission reduction measures implemented contribute to the achievement of SOCAR's Decarbonization Strategy and its established long-term emission reduction targets. The key targets set by SOCAR are as follows:

- Eliminate routine flaring across all operational areas by 2030;
- Reduce emission intensity in the Upstream segment by 30% by 2030, compared with the 2022 baseline year;
- Reduce corporate emission intensity by 30% and absolute emissions by 20% by 2035, compared with the 2022 baseline year;
- Reduce methane emission intensity in the Upstream segment down below 0.2% by 2035;
- Achieve the "Net Zero" target across SOCAR by 2050.

Thus, optimization and energy efficiency measures are aimed at reducing CO_2 emissions across all areas of SOCAR's operations, while methane emission monitoring and LDAR activities focus particularly on the more accurate identification, measurement, and reduction of methane emissions in the **Upstream and Midstream segments**. The systematic implementation of these measures contributes to the progressive achievement of SOCAR's decarbonization and emission reduction targets for 2030, 2035, and 2050.

The detailed description of the mentioned measures is following:

- Reduction of energy consumption and associated CO_2 emissions through the analysis and optimization of existing operational processes and technological regimes; implementation of measures aimed at reducing energy intensity in production processes, determining optimal equipment loading regimes, ensuring the efficient use of fuel and electricity, and minimizing process-related losses;

- Assessment of the energy efficiency of production equipment and processing, identification of energy-intensive equipment and processes, and transition to more efficient operating regimes. Optimization of operating conditions for compressors, pumps, gas turbines, boilers, furnaces, and other energy-intensive equipment; reduction of energy consumption during idle or low-load operation; and prevention of technical losses;

- Application of energy efficiency principles during the design and implementation stages of new projects, taking into consideration energy consumption and greenhouse gas emissions matters from the earliest stages of project development. Evaluation of energy efficiency as a key criterion during selection of new equipment and technologies; use of high-efficiency motors and equipment; reduction of heat losses; recovery of thermal energy; and, where feasible, implementation of opportunities for the reuse of waste heat;
- Regular monitoring of energy consumption and CO_2 emissions across processes, identification of areas with high emissions and energy intensity, analysis of the underlying causes, and implementation of appropriate optimization measures. Comparative assessment of the results of the measures implemented against indicators from previous periods and systematic documentation of the emission reductions achieved.
- Broader use of automation, digital monitoring, and process control capabilities in operational processes to improve energy efficiency. Real-time monitoring of energy consumption and key process parameters, identification of abnormal or excessive consumption, and provision of timely operational intervention;
- Reduction of fuel consumption and volumes of gas flared, minimization of process gas losses, more efficient use of fuel in operations, and assessment of opportunities to use lower-carbon energy sources where feasible. These measures are expected to reduce not only energy consumption but also associated CO_2 emissions;
- Conducting drone-based surveys throughout 2026 within SOCAR's **Upstream segment** to detect, measure, and monitor methane emissions. During the monitoring activities, measurement systems based on advanced sensor technologies are used to detect methane emissions. The surveys cover designated monitoring areas at production facilities and enable the prompt identification of emission sources.
- Conducting measurements and assessments of identified methane emission sources across all SOCAR segments, prioritizing emission sources, and implementing appropriate repair and corrective measures, including Leak Detection and Repair (LDAR), to address identified leaks. Following repair activities, repeat monitoring is carried out to verify that the leaks have been successfully eliminated and to assess the effectiveness of the measures implemented;
- Systematization and analysis of the measurement and monitoring results obtained for methane emissions, improvement of emission inventories, and use of the results to support the monitoring and reporting of SOCAR's greenhouse gas emissions and the planning of emission reduction measures;
- Evaluation of the results of the energy efficiency, process optimization, and methane emission reduction measures implemented; documentation of the CO_2 and CH_4 emission reductions achieved; and assessment of the contribution of these measures to achieving the emission intensity and methane emission reduction targets established under SOCAR's decarbonization strategy.

Overall, these measures are aimed at ensuring more efficient use of energy and resources, reducing operational losses and energy intensity, minimizing CO_2 and methane emissions, enabling more accurate identification of emission sources, and contributing to the achievement of SOCAR's strategic greenhouse gas emission reduction targets.

In 2026 the monitoring activities are being carried out to detect and measure methane emissions at production facilities and relevant operational assets within SOCAR's. Appropriate repair and corrective measures are being implemented for newly identified leakage sources, and the effectiveness of the measures taken is being verified through follow-up monitoring.

As a part of the implementation of the mitigation measures and assessment of the results achieved, the relevant facilities prepare and consolidate monthly statistical data on environmental performance indicators. Based on the collected data, quarterly analyses are conducted, and trends in emission indicators and carbon intensity are monitored.

The measures outlined above are financed from SOCAR's own resources. As part of the implementation of the action plan, the emission reductions achieved through the measures implemented are quantified and documented at the end of each year.

Emission reduction effect (in CO2 eq.): The mitigation measure is primarily aimed at reducing carbon dioxide (CO_2) and methane (CH_4) emissions. As a result of measurement activities conducted across SOCAR up to January 2026, a total of **1,417 methane emission leakage sources** were identified. Under the LDAR project, **1,166 of the identified leakage sources** have been repaired and remediated. As a result of the repair and corrective measures implemented, approximately **1 million tons of CO_2 eq.** of emissions were prevented and/or reduced during 2025. This result demonstrates a tangible impact of the systematic detection, measurement, and remediation of methane emissions on overall emission reductions.

Other socio-economic and international cooperation contributions including SDGs implementation. As a result of the implementation of the measure, methane emissions from SOCAR's oil and gas production activities are managed more effectively, while operational efficiency is improved. The timely identification and remediation of emission sources contribute to reducing natural gas losses and the associated potential economic losses. Continuous monitoring and data analysis also support improved decision-making in emission management and help strengthen technical and institutional capacity. At the same time, the implementation of the measure contributes to SOCAR's climate change commitments, enhances the transparency of emissions monitoring and reporting, and supports improvements in sustainable development performance indicators.

4. **Seal gas start-up temperature reduction at Sangachal terminal Shahdeniz-2 area implemented by bp**

***Objective*:** Process modification led to reduction in use of gas for fuel in the oil and gas sector

Responsible organization: *bp*

Description: In the oil and gas industry, various technological changes are really being introduced that can reduce the consumption of gas as a fuel. These measures are aimed at improving energy efficiency, optimizing production processes and reducing operating costs. In 2023-24 bp implemented a technology aiming to reduce seal gas start up temperature that resulted in emission reduction was carried out for 12 months

Emission reduction effect (in CO2 eq.): 23.116 Kt CO_2 eq. emissions.

Other socio-economic and international cooperation contributions including SDGs implementation: Saving associated gas can be delivered to customers.

5. **HP valve passing to flare at West Azeri platform implemented by *bp***

***Objective*:** Reduction of resource waste in the oil and gas sector

Responsible organization: *bp*

Description: HP flare activates during plant shutdowns, or during planned events. From the start-up of platform, the HP flare valve had problem with actuator: it was opening for large volume flare and then not shutting. Thus, gas was passing at the rates of 1.5-3 mmscf/d. Simple replacement would not solve the issue, therefore the team came up with a solution to modify the actuator on the new valve. Installation of the new modified valve in April 2021 has solved the issue and saved gas passing to flare.

Emission reduction effect (in CO2 eq.): Measurement of the emission reduction was carried out for 12 months in 2021-22: 36.400 Kt CO_2 eq. emissions (of which 15.764 Kt CO_2 eq. emissions in 2022).

Other socio-economic and international cooperation contributions including SDGs implementation: Saving associated gas can be delivered to customers.

6. **Fuel gas consumption reduction due to stopping one FGC at Central Azeri platform implemented by *bp***

***Objective*:** Reduction of energy consumption within oil and gas sector

Responsible organization: bp

Description: Accounting of the emission reduction was carried out for 12 months in 2023-24.

Emission reduction effect (in CO2 eq.): 14.559 Kt CO_2 eq. emissions

Other socio-economic and international cooperation contributions including SDGs implementation: Saving associated gas can be delivered to customers.

7. **Reconstruction of boilers in the "Azeristiliktachizat" OJSC**

***Objective*:** Reconstruction of 70 boiler houses that have reached the end of their service life and equipping them with modern equipment

Responsible organization, implementing body, and coordination issues is **"Azeristiliktachizat" OJSC**

Description. The mitigation measure (for 2022-2030 years) targets Reconstruction of 70 boiler houses that have reached the end of their service life and equipping them with modern equipment. Reconstruction works have been carried out at Boiler Houses (BH) No. 510, 504 and 505 in Sabail District; BH No. 72, 86 and 92 in Narimanov District; BH No. 140 and 141 in Yasamal District; BH No. 537, 515 and 539 in Nizami District; BH No. 533 in Pirallahi District; BH No. 04/8 at the Agjabadi District Heating and Hot Water System (DHHWS); and BH No. 45/3 at the Mingachevir DHHWS. As part of these works, the boiler houses were converted into modern facilities, automation systems were introduced, and modern, highly energy-efficient equipment was installed. In addition, this year, the operation of the outdated BH No. 50/8 in Sumgayit and BH No. 175 in Sabunchu District was discontinued and replaced with modern modular boiler houses. Under the project for the modernization of the outdated BH No. 129 in Yasamal District, design and cost-estimate documentation was prepared and underwent expert review. The procurement procedure is currently ongoing. For the following year, projects have been planned to modernize four outdated boiler houses and convert them into modern facilities: BH No. 119 in Narimanov District, BH No. 128 in Yasamal District, BH No. 203 in Binagadi District, and BH No. 531 in Garadagh District. It's funded by state at 32, 20082 million USD.

Emission reduction effect (in CO2 eq.): Positive results have been achieved through the reduction of fuel consumption, improvement of the efficiency of heat supply, and ensuring the reliable operation of heating equipment. Across 14 boiler houses, the specific gas fuel consumption was reduced from 197.9 m^3/Gcal to 134.02 m^3/Gcal, representing an approximately 32.3% reduction in specific fuel consumption. As a result, the amount of natural gas required to produce 1 Gcal of thermal energy has been significantly reduced, more efficient use of fuel has been achieved, and conditions have been created for reducing GHG emissions.

Other socio-economic and international cooperation contributions including SDGs implementation - the mitigation measure has resulted in improvements in energy efficiency, having a positive impact on reducing **local air pollution.**

8. **Identification of alternative options to expand heat supply to some social buildings by "Azeristiliktachizat" OJSC.**

Objective: Identification of alternative options to ensure the heat supply of consumers, including 20,957 apartments in 209 residential buildings, 25 schools, kindergartens,

healthcare facilities, and approximately 100 other economic entities in Khatai District, Baku, following the suspension of operations of the Baku Combined Heat and Power Plant, owned by Azerenerji OJSC.

Responsible organization, implementing body, and coordination issues is **"Azeristiliktachizat" OJSC**

***Description*.** The mitigation measure (for 2022-2030 years) is aimed at expansion of the heat supply system, optimization of management, and improvement of service quality. Under the project to modernize two heating substations of the Baku CHP Plant (Mah. 2935A Heating Substation No. 1 and YNS-2) and convert them into boiler houses, design and cost-estimate documentation was prepared and subjected to expert review. A tender procedure was conducted in line with the allocated funding, and the winning bidder was selected. Construction and installation works are currently underway. The project also envisages the reconstruction of the external gas supply, electricity supply, and water supply systems, as well as the internal district heating networks serving these heating substations. The project is funded by state at 14,76468 million USD.

Emission reduction effect (in CO2 eq.): It is expected that positive results will be achieved through improving the efficiency of heat supply, ensuring the provision of high-quality thermal energy to consumers, and ensuring the reliable operation of heating equipment.

Other socio-economic and international cooperation contributions including SDGs implementation - the mitigation measure has resulted in improvements in energy efficiency, having a positive impact on reducing **local air pollutants.**

9. Gradual reconstruction of five outdated heating boilers.

Objective: Gradual reconstruction of five district heating boiler houses commissioned in the 1970s–1980s and their conversion into local neighborhood boiler houses.

Responsible *organization,* implementing body, and coordination issues is **"Azeristiliktachizat" OJSC**

Description. The mitigation measure (for 2022-2030 years) focusses on gradual reconstruction of five district heating boiler houses commissioned in the 1970s–1980s, which currently perform the function of distributing the thermal energy produced, and their conversion into local neighborhood boiler houses. The project is funded by state at 35,7794 million USD.

Emission reduction effect (in CO2 eq.): Reduction of GHG at 4.82 Kt in CO2 eq., for annual savings of 2.3 million m³ of natural gas.

Other socio-economic and international cooperation contributions including SDGs implementation - the mitigation measure has resulted in improvements in energy efficiency, having a positive impact on reducing **local air pollution.**

10. **Regular servicing, major repairs, and rehabilitation works are carried out to ensure the operation of boilers in "Azeristiliktachizat" OJSC**

***Objective*:** Regular servicing, major repairs, and rehabilitation works are carried out to ensure the operation of boiler house and heating network equipment in compliance with safety, occupational health and safety, and operational requirements.

Responsible *organization,* implementing body, and coordination issues is **"Azeristiliktachizat" OJSC.**

Description. The mitigation measure has been implemented since 2022 for the period of 2022-2030 and aims to reduce GHG emissions in heating operations of boilers. Under repair works, 164 burners, 3,016 pumps, 18,159 valves, 3,100 motors, 1,094 boiler units, and 18,528 m² of thermal insulation were repaired. In addition, 54,637 m of heating pipelines, 29,280 m of boiler tubes, 3,867 elbows, 27 steel-pipe burners, 27 heat exchangers, 38 pumps, 1,251 valves, 15 motors, 76 check valves, and 550 control valves were replaced. A total of 1,873 m of underground and above-ground gas pipelines were renewed. Furthermore, 9 reserve water tanks, 13 water-softening units, and 10 boilers were newly installed. 751 sets of heat exchange equipment were cleaned mechanically and chemically. As part of annual adjustment and optimization works, 1,309 boiler units were mechanically cleaned. Tightness was ensured to maintain the excess air coefficient within the required range, and the combustion process was optimized and adjusted. Flue gas ducts at 548 boiler houses were cleaned, while instrumentation and automation equipment were inspected and adjusted. As part of other technical works, expansion tanks were inspected and 187 rubber membranes were replaced. 18,528 m² of thermal insulation on heating pipelines was repaired. In the gas facilities, 326 gas meters underwent state inspection.

Overall, more than 88,000 pieces of equipment and installations, including control and regulating valves and equipment, are inspected and repaired annually across the Company and prepared for safe and reliable operation.

Emission reduction effect (in CO2 eq.): As a result of the works carried out, specific gas fuel consumption was reduced from 140.3 m³/Gcal to 136.5 m³/Gcal, representing an approximately 2.7% reduction in specific fuel consumption. By the end of the mitigation measure, CO_2 emissions were reduced from 257,062.2 tons level to 236,308.84 tons, representing an approximately 8.1% reduction of GHG emissions.

Moreover, the technical condition of the boiler houses and heating networks has been improved, while the reliability and operational safety of the equipment have been enhanced. The repair and replacement of boiler units, boiler tubes, heating pipelines, pumps, and heat exchange equipment have created conditions for improving the efficiency of thermal energy production and transmission, as well as minimizing heat losses and emergency incidents. The mechanical and chemical cleaning of heat exchange equipment has improved its heat transfer performance. The inspection and replacement of gas pipelines, gas shut-off valves, valves, and regulating equipment have ensured the safe and reliable operation of the gas facilities. The installation of pressure gauges and thermometers has improved monitoring and measurement capabilities. As a result of these comprehensive measures, more efficient use of energy resources, improved quality and continuity of heat supply, and conditions for reducing greenhouse gas (GHG) emissions have been achieved.

Other socio-economic and international cooperation contributions including SDGs implementation - the mitigation measure has resulted in improvements in energy efficiency, having a positive impact on reducing **local air pollution.**

11. Implementation of remote monitoring and control systems for reconstructed and modernized boiler houses

Objective: Establishment of the monitoring and control systems for optimization of the process and reduction of GHG emissions

Responsible *organization,* implementing body, and coordination issues is **"Azeristiliktachizat" OJSC**

***Description*.** Reduction of GHG emissions, implementation of safe management, optimization of operations, the project is funded by the government at 7,28298 million USD for 2022-2030.

Emission reduction effect (in CO2 eq.): will be assessed upon provision of the detailed info.

Other socio-economic and international cooperation contributions including SDGs implementation - the mitigation measure has resulted in improvements in energy efficiency, having a positive impact on reducing **local air pollutants.**

12. Regenerative Braking Energy (RBE) Use in the Baku Metro.

***Objective*:** Efficient utilization of energy generated through the regenerative braking system towards energy efficiency purposes.

Responsible *organization,* implementing body, and coordination issues is **"Baku Metropolitan" CJSC**

Description. The new-generation locomotives (for instance, so called "three-phase locomotives") of trains of the Baku Metro are equipped with a regenerative braking system that converts the kinetic energy generated during train braking into electrical energy, enabling this energy to be used for the operation of other trains. The main objective of the measure is to ensure efficient energy use and improve energy efficiency. The impact of the regenerative braking system of the new-generation trains on energy efficiency was assessed as part of tests conducted in October 2025. Between 14 and 28 October 2025, tests were conducted on the regenerative braking function of the new-generation trains. Based on the test results, an indicative assessment of the energy-saving potential was obtained. The procurement of the new-generation trains was financed through government support.

Emission reduction effect (in CO2 eq.): During the tests, total electricity savings of 321,554 kWh were recorded for train traction when the system was active, with average daily savings amounting to 45,937 kWh/day. As a result of the mitigation measure, there is potential to reduce indirect CO_2 emissions through a reduction in electricity consumption for train traction. During the testing period, 321,554 kWh of electricity was saved. Based on the 321,554 kWh of energy savings recorded during the testing period, the indicative potential for emissions reduction is estimated at approximately 120,1 tons CO_2 eq. emissions.

Other socio-economic and international cooperation contributions including SDGs implementation - It contributes to the optimization of operational costs through more efficient use of electricity and reduced energy consumption, improved resource efficiency, and the promotion of low-carbon urban mobility.

13. LED Lighting switch in the Baku Metro

Objective: Transition to energy-efficient LED lighting systems in the Baku Metro.

Responsible *organization,* implementing body, and coordination issues is **"Baku Metropolitan" CJSC.**

Description. The measure envisages the gradual replacement of conventional lighting fixtures, which are characterized by high energy consumption and relatively short service lives, with modern LED lighting systems at metro stations. Between 2022 and 2026, LED lighting systems were installed in various areas of 17 stations.

The installation of LED lighting systems at the stations is financed by the government. At these stations, LED lighting has been installed in vestibules, some service rooms, passageways, track areas, and platforms, depending on the specific characteristics of each

station. The transition to LED lighting is planned to be continued at the remaining stations, as well as in other areas of the existing stations in close future. The transition to LED systems at the remaining stations is going on.

Emission reduction effect (in CO2 eq.): In 2025, an estimated annual electricity saving of 38,544 kWh was calculated under a pilot project at Sahil Station, which involved the replacement of 400 lamps on the platform. Based on the recorded energy savings, the indicative potential for emissions reduction is estimated at approximately 23 tons CO_2 eq.

Other socio-economic and international cooperation contributions including SDGs implementation - The measure contributes to optimizing electricity consumption and operating costs, improving lighting quality, and enhancing the passenger environment.

At the same time, improvement of energy efficiency stipulates Baku Metro's transition toward the low-carbon and sustainable public transport system.

14. Reduction of losses in electricity distribution networks, digitalization, and expansion of smart metering systems by "Azerishiq" OJSC

***Objective*:** to reduce technical and non-technical losses in the distribution network, use every unit of electricity entering the grid more efficiently, improve the reliability and quality of electricity supply, optimize operational costs, and create technical capabilities for the safe integration of renewable energy sources into the grid.

***Responsible organization,* implementing body, and coordination issues is "Azerishiq" OJSC**

Description. Starting in 2022 and still going on, the company has been implementing renovation of outdated lines and equipment, creation of new power centers, and optimization of carrying capacity and voltage levels in order to reduce technical losses and voltage drops; increased reliability, replacing under- or overloaded transformers with appropriately powerful units, putting seasonal transformers on standby, and establishing phase and load balance for reduction of downtime and load losses, efficient operation of equipment. Moreover, improving the power factor in the network and consumer farms, limiting reactive energy flows for reduction of current and I^2R losses and efficient use of network capacity.

Besides that, it conducts establishment of smart meters, remote metering, automated accounting and balance control for increasing measurement accuracy, timely detection of imbalances and non-technical losses. For digital network and SCADA matters conducting real-time monitoring, digital substations and control centers, operational detection of incident and accident locations for improving Real-time monitoring, digital

substations and control centers, operational detection of incident and accident locations for efficiency of the operational management, short recovery time, targeted elimination of losses and malfunctions. For green energy integration preparing the distribution network for active consumers, distributed generation and renewable energy sources in order to create conditions for integrating clean energy into the grid and replacing fossil-based generation.

Implementation stages

- Initial assessment (Analysis of energy balances, loss levels, loads and technical condition of equipment; selection of priority areas);
- Engineering (Preparation of technical solutions, estimates, procurement plan, environmental and safety requirements);
- Construction and installation (Installation and renovation of lines, substations, transformers, measurement and communication systems);
- Digital integration (SCADA, AMI/AMR, electronic mapping, data exchange and remote management);
- Testing and commissioning (Technical tests, balance checks, safety and acceptance procedures);
- Monitoring, reporting and scaling up (Calculation of annual energy balance, losses and emission reductions in accordance with MRV; expansion to new areas according to results).

The geographical coverage is republic-wide and covers the distribution networks served by "Azerishig" OJSC. Priority is given to areas with high losses, outdated equipment, rapidly increasing load, and a need to improve the quality of electricity supply. In addition to Baku and Absheron, digital and smart grid elements implemented in the regions, including the Karabakh and East Zangezur economic regions, based on the requirements of the "Green Energy Zone".

Official example: The Digital Substation project developed in Zangilan involves digital metering, automated control, and integration of green energy sources into the grid. The event is not a single, one-time event; it is an ongoing program consisting of separate projects and work packages for different regions and voltage levels. In certain parts of the network, reconstruction, smart metering, and digital management components have been completed and put into operation, while in other parts, design, procurement, construction, installation, and expansion work is ongoing. According to open data for 2022, 100 residential settlements with high losses were selected; at the time of that report, works had

been completed in 54 villages, while work was still ongoing in the remaining 46 villages within the following periods:

Reporting on baseline and large-scale reconstruction works (2022); Continuation of modernization, digitalization, and smart metering (2023-2025); Ongoing and new work packages (2026-present); Expansion in accordance with the investment program (next stage)

The main impact of the measure is the reduction of losses in the electricity distribution network, which reduces the need for additional generation at power plants. Therefore, the main abatement gas is CO_2. If the grid emission factor used includes not only CO_2 but also CH_4 and N_2O emissions from fuel combustion, the result should be expressed in CO_2-equivalents.

The measures financed within the framework of the approved investment and operational programs of ”Azerishiq” OJSC, as well as state-funded capital investments applied to individual infrastructure projects.

Emission reduction effect (in CO2 eq.): Open official data indicates that energy losses along 10/6 kV outgoing lines supplying 100 residential settlements were reduced by 20.6 million kWh. This indicator was adopted in the current report as activity data for calculating the emission reduction impact of the mitigation measure: 7.520 Kt CO_2 eq. emissions.

Based on open data, the technical loss indicator was 8.6% in 2024 and 8.5% in 2025. If the same scope and methodology confirmed, the energy effect of a 0.1 percentage point improvement is calculated as follows:

Calculation formula: $\Delta E_loss,2025 = E_in,2025 \times (8.6\% - 8.5\%) = E_in,2025 \times 0.001$

Then: $ER_2025 = \Delta E_loss,2025 \times EF_grid,2025$ (E_in,2025 is the electricity entering the benchmark grid boundary in 2025).

For the period from 2022 to the present, the verifiable minimum emission reduction estimated in this report is 7.500 Kt CO_2 eq. The cumulative indicator for 2023-2026 calculated based on annual energy balances, separation of technical and non-technical losses, and network emission factors for the relevant years.

Other socio-economic and international cooperation contributions including SDGs implementation - Job and training opportunities in construction, operations, digital systems and maintenance. Indirect reduction of air pollutants when fossil-based production reduced; safe replacement of old equipment.

15. Energy Efficiency Project at the Sangachal and H.Z. Taghiyev No. 2 pumping stations by Azerbaijan State Water Resources Agency (ADSEA) and "SOCAR Green" LLC

Objective: the main objective of the project is to achieve energy savings and therefore to reduce financial costs.

***Responsible organization,* implementing body, and coordination issues -** Under the Energy Efficiency Agreement and Memorandum of Understanding signed between the Azerbaijan State Water Resources Agency (ADSEA) and "SOCAR Green" LLC.

***Description*.** The Energy Efficiency (EE) Project at the Sangachal (Baku) and H.Z. Taghiyev No. 2 (Sumgait) pumping stations, the existing pumps and associated equipment at the pumping stations are to be replaced with more energy-efficient equipment. As a result of the preliminary project assessment, the existing (baseline) energy consumption and costs for both stations, as well as the expected indicators following the replacement of the equipment, have been determined. The project will be implemented in the cities of Baku and Sumgayit. The proposal submission stage of the tender process for the phased implementation of the Energy Efficiency Project was completed on 7 August 2026. Contract was signed on 4 September 2026. According to the implementation schedules submitted by the participants, the overall implementation period of the project is projected to be approximately 12–16 months from the commencement date.

Emission reduction effect (in CO2 eq.) Taking into account the projected annual electricity savings for two pumping stations are of 21.18 GWh and consequently, an overall reduction of approximately 7.96 Kt CO_2 eq. per year is expected.

Other socio-economic and international cooperation contributions including SDGs implementation – During implementation of the project, annual energy consumption savings are expected at appr. 10 million kWh for each of the Sangachal and H.Z. Taghiyev No. 2 pumping stations. Consequently, the economic savings exceeding AZN 1 million per year for each of the two pumping stations are supposed to be directed to the socio-economic projects by the Azerbaijan State Water Resources Agency.

16. Energy efficiency measures implemented by *bp* and their emission reduction capacities:

No	Facility	Project title	2022	2023	2024
1	CA	GIC3 combustion air filtration upgrade	1667 (CO_2 e)	349(CO_2 e)	0 (CO_2 e)

2	CA	GEC cooler clean out	4167	6107	
3	CA	GIC2 combustion air filtration upgrade		698	1396
4	CA	Fuel gas consumption reduction due to stopping one FGC		8088	6471
5	CA	Logic modifications to GIC2 turbine controls		3871	7741
6	CA	GIC4 combustion air filtration upgrade	500		
7	WA	Stripping gas reduction		454	
8	WA	HP valve passing to flare	15764		
9	EA	Stripping gas reduction	458	642	
10	Ch1	Purge rate reduction	875	661	
11	Ch1	PW optimization	583	440	
12	Ch1	Stripping gas to water injection	857	1811	
13	Chirag1	Flaring reduction due to gas rates optimization		8362	
14	Chirag1	Optimization of stripping gas in Glycol regeneration system		172	229
15	Ch1	Stripping gas reduction	300		
16	Ch1	Optimization of starting well to test separator	5		
17	WCH	Compressors' LOWF logic removal	2197	6901	
18	WCH	Flaring reduction during well swap over		294	392
19	WCH	Prevent flaring while doing HP Piggyback well test program		470	418
20	WCH	Prevent flaring while starting plant from SD		2613	
21	SDA	Hydrate management methodology optimization		107	107
22	SDB	Pressure reduction in MEG drums		67	
23	SDB	Spinning Reserve Reduction	3635		
24	ST	Camp accommodation optimization	22	16	
25	ST ACG	Ph1 FGRU start-up	8405	4169	
26	ST ACG	Train 2 COH performance improvement	5885	2067	
27	ST ACG	Train 3 COH performance improvement	6618	5697	
28	ST ACG	Train 6 COH performance improvement	6856	3013	
29	ST SD	FGC start-up logic modification	35	43	
30	ST SD	GEC flaring logic modification	22	6	
31	ST SD	Set point and trip point modification in SD1 Recompressor	5000	1070	
32	ST SD	GECs load sharing mode tuning	20	10	
33	ST SD	Startup flaring optimization	1149	983	
34	ST SD	Maximizing condensate crossover		567	1133
35	ST SD	Seal gas startup temperature reduction		12238	10878
36	ST SD	Fuel gas startup temperature reduction		2772	
37	ST SD	Advanced Process Control implementation		210	
38	ST SD	Turbo-Expander package Lube Oil system DP PALL time delay		7878	
39	ST SD	Flaring reduction upon FGRU trip		212	283
40	BTC	Solar panel installation on BV (1st phase),	5	25	
41	Pipelines	Low load Management for WREP Generators (Az)	59	270	
42	Logistics	Replacement fleet with EV vehicles	12	6	
43	Logistics	Fleet renewal		19	
44	Pipelines	light vehicle optimization Az	81	81	
45	Pipelines	further light vehicles optimization		88	
46	Serenja	Grid electricity		138	

7.2. MITIGATION MEASURES IN THE CITIES AND THE TRANSPORT-ROAD COMPLEX (TRC)

7.2.1. MITIGATION POLICIES IN URBAN PLANNING AND HEALTH SECTORS

The country has been implementing a number of activities on increasing energy efficiency, enlargement of renewable energy use and other mitigation policies and measures in urban planning and green city development. The following regulatory documents aimed at increasing energy efficiency, ensuring the efficient use of energy resources, regulating the application of renewable energy sources, and thereby contributing to the reduction of greenhouse gases, particularly CO_2 emissions, were prepared and duly approved in 2023–2025 for the State Committee for Urban Planning and Architecture of the Republic of Azerbaijan:

- **AzDTN 2.12-4** "Thermal Protection of Buildings. Design Standards";

- **AzDTN 2.12-6** "Thermal Insulation of Equipment and Pipelines. Design Standards";

- **"Requirements for the Installation of Rooftop Solar Energy Systems"**;

- **"Requirements for the Application of Energy-Efficient Green Technologies (Solar Panels) in Street and Road Lighting"**;

- **AzDTN 2.7-5** "Fuel and Electric Charging Stations. Design Standards."

In addition, the spatial planning documents (master plans and detailed/general plans) prepared at the request of the Committee provide for the creation and expansion of green areas and green corridors, the development of pedestrian and cycling infrastructure, improved accessibility to public transport, and the promotion of the use of renewable energy sources and energy-efficient technologies, with the aim of ensuring sustainable urban development. The implementation of these urban planning solutions contributes to reducing CO_2 emissions resulting from transportation and energy consumption.

Moreover, as health sector is one of the crucial fields in terms of climate resilience and decarbonization for each country, the Republic of Azerbaijan was among Central Asia

Regional Economic Cooperation (CAREC) Program countries, where the “Decarbonization Strategy for the Health Sector for 2026–2030” has been developed and endorsed by the Health Working Group and the Climate Change Working Group established under the CAREC Program of the Asian Development Bank (ADB). The main objective is to define a strategic approach **of** the decarbonization of the health sector in the countries participating in the CAREC Program. The document outlines measures aimed at establishing an evidence base, identifies practical implementation steps, and facilitates the exchange of regional experience among stakeholders in the health sector. **Currently at the preparatory stage for official adoption and implementation of the document. As a result of the gradual implementation of the strategy the corresponding results on GHG emissions (CO_2, N_2O, NO, HFCs and methane (CH_4)) will be reflected in the next BTR.**

7.3 MITIGATION POLICIES AND MEASURES IN TRANSPORT SECTOR

7.3.1. AUTOMOTIVE TRANSPORTATION INDUSTRY

From April 1, 2014, Euro-4 environmental standards are applied to motor vehicles circulating in the territory of the Republic of Azerbaijan. According to applicable legislation, lower excise duty rates are imposed on passenger vehicles with smaller engine volumes imported into the Republic of Azerbaijan. A policy is in place to apply lower insurance premiums for the compulsory insurance of the civil liability of passenger vehicles with small engine volumes.

Starting from January 1, 2019, electric vehicles and since January 1, 2020, buses operating on compressed gas have been exempted from value-added tax (VAT) upon import for a period of 5 years. Lower import customs duties are applied to vehicles that have not been in operation for less than 1 year since their manufacturing date.

Wherever possible, bus stop "bays" and special traffic lanes for buses are being created.

In the administrative territory of Baku city, it is required that buses performing passenger transport be equipped with compressed natural gas (CNG) or electric engines. Currently, approximately 38% of the buses in operation use CNG fuel.

In 2020, 100 new "LEVC" brand (electric-powered) taxi vehicles were imported into the country and put into service. Works on the electrification of the taxi fleet are ongoing.

In 2022, the "Rules for developing an Urban Mobility Plan" were approved.

As of January 1, 2022, the import and sale of hybrid vehicles with a manufacturing date less than 3 years and with engine capacities not exceeding 2500 cubic centimeters, were exempted from value-added tax (VAT). Similarly, the import and sale of second- and third-level electric vehicle chargers for electric vehicles have been exempted from VAT since January 1, 2022.

The import duty rate is set at 0% (previously 15%) for electric-powered passenger cars up to 3 years from the date of manufacture, while the import duty rate is set at 0% (previously 5%) for second and third level chargers for electric vehicles.

For electric-powered buses, the import duty rate has been set at 0% (previously 15%).

To renovate/modernize the transport fleet, an increased excise duty rate is applied to the import of gasoline and diesel passenger vehicles older than 7 years. Besides, the import of passenger vehicles older than 10 years (excluding rare vintage vehicles and those temporarily brought into the customs territory) to the territory of the Republic of Azerbaijan has been restricted.

The internet information resource "edm.ayna.gov.az" has been created, which displays information about electric vehicle charging stations (EVCS) on an interactive map.

7.3.2. RAILWAY TRANSPORTATION SECTOR

The “TA-AZE: Preparing Azerbaijan Railway Company Decarbonization Project” financed by the Asian Development Bank (ADB) for **Azerbaijan Railways (ADY)** project is currently under implementation and aims to establish a comprehensive decarbonization framework for ADY, improve energy efficiency, assess the potential for renewable energy development and the opportunities for participation in the carbon markets, as well as prepare the required technical and economic feasibility

assessment. International consulting companies such as “Creative Consulting Company”, “RINA Consulting”, “Grütter Consulting”, as well as the national experts were selected by the ADB to be engaged in project implementation from April 2025 to December 2027.

The key objectives of the project include:

- developing a decarbonization investment program for ADY;
- assessing the energy network and infrastructure;
- conducting technical and economic feasibility studies for solar energy and battery energy storage systems (BESS);
- assessing current energy consumption;
- evaluating social and environmental impacts in accordance with ADB standards; and
- developing financial and economic models, including IRR, NPV, WACC, cash-flow projections, and other relevant calculations.

The project also includes activities aimed at strengthening ADY’s procurement mechanisms, preparing technical specifications, developing a Strategic Procurement Plan, and enhancing institutional capacity through training programs, workshops, and international study visits.

The main stages of the project include an assessment of the regulatory and institutional frameworks governing the energy and railway sectors, risk assessment, technical due diligence of ADY’s energy systems and infrastructure, assessment of social and gender impacts, climate risk analysis, preparation of financial and economic feasibility assessments, preparation of procurement documents; and implementation of capacity-building programs for ADY staff.

The project covers a broad range of areas within ADY, including energy management, the electricity network, station and depot infrastructure, communications and SCADA systems, rolling stock, environmental and social functions, as well as finance, procurement, and sustainability structures. As a result, the project will deliver a decarbonization investment program for ADY, a roadmap for the modernization of the energy network, a carbon credit monetization model, a package of procurement and technical documentation, social and environmental reports, and financial and economic analyses. The project will also strengthen the company’s institutional knowledge and technical capacity.

Within the framework of the project, the inception reports prepared by each consulting firm have been submitted, including the Carbon Footprint Assessment Report and the Carbon Market Study Report. The next documents expected from the consulting firm and experts include documents related to the assessment and technical and economic feasibility assessment of the electricity network.

The implementation of the project will contribute to improving energy efficiency, increasing the use of renewable energy, and modernizing the energy system have an essential potential to reduce both direct and indirect GHG emissions.

To date, the preparation and submission of the project's inception reports have been completed. The Carbon Footprint Assessment Report and the Carbon Market Study Report have already been submitted. The relevant work is ongoing on the project's energy system, infrastructure, climate risks, social and gender impacts, financial and economic indicators, and procurement components. The preparation of documents for the analysis and technical and economic feasibility assessment of the electricity network is expected at the next stage. The project is financed by the Asian Development Bank (ADB). At the current stage, the main outcome is the establishment of the technical and institutional foundation for emissions reductions, rather than actual reductions in emissions. A carbon footprint assessment has been conducted, and future decarbonization measures are being identified.

The project also includes activities aimed at strengthening ADY's procurement mechanisms, preparing technical specifications, developing a Strategic Procurement Plan, and enhancing institutional capacity through the organization of training programs, workshops, and international study visits.

Here's some other concrete mitigation measures implemented or planned by Azerbaijan Railways (ADY):

1. AC50 mainline diesel locomotives equipment

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing entity, coordination arrangements, all stages of implementation of the measure, etc.	AC50 mainline diesel locomotives equipped with advanced technologies: 7 mainline freight diesel locomotives equipped with AC traction drive systems. The main traction system employs an AC-DC-AC electric transmission system. The traction motor is a three-phase asynchronous motor connected to the wheelset by means of a roller-bearing-supported suspension arrangement. The auxiliary transmission system utilizes AC power transmission technology. The locomotive is equipped with a Z16V280ZJ diesel engine with a rated power output of 3,680 kW under UIC conditions. The locomotive has a $C0$-$C0$ axle arrangement, a track gauge of 1,520 mm, an axle load of 25 tones, and a maximum operating speed of 120 km/h. The locomotive's electrical system is microcomputer-controlled and is equipped with a rheostatic braking system capable of performing full-power self-load testing. It uses a Knorr electro-pneumatic braking system compliant with GOST standards and features multiple-unit (multi-section) control functionality. The diesel locomotives are additionally equipped with a climate control system and incorporate measures to protect against electromagnetic radiation and infrasound during construction.
2	Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan in which it is implemented.	It will be used for freight transportation along international transport corridors passing through the territory of Azerbaijan.

3	Status of the mitigation measure (implemented; currently under implementation; officially approved for implementation but not yet commenced; or in the planning stage without having been officially approved for implementation).	Officially approved for implementation but not yet commenced.
4	Implementation period of the mitigation measure (specifying the start and end years of implementation, including the exact timeframe for each phase, where applicable).	2026
5	Which type(s) of greenhouse gas (GHG) emission sources is the mitigation measure targeting, or which gases are involved in removals, and which gases, and in what quantities (expressed in total CO_2 equivalent), will be reduced as a result of the mitigation measure? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), or other emissions with indirect radiative effects (SO_2, NO_x, CO), etc.	The Stage IIIA AC50 model complies with the emission standards established by the International Union of Railways (UIC). This enables the locomotive to be operated in areas subject to specific emission requirements. The Stage IIIA standards established by the International Union of Railways (UIC) set stringent limits on harmful emissions of nitrogen oxides (NOx), carbon monoxide (CO), and particulate matter (PM_{10}). **NOx / CO / HC / PM**
6	What stages of the mitigation measure have been completed to date, what preliminary results have been achieved, and what sources of financing have been used (e.g., government funding, donor-funded projects, etc.)?	**Preliminary results:** Significant reductions in emissions. The modern AC50 mainline diesel locomotive, equipped with innovative traction systems and featuring high technical performance, provides high tractive power, fuel capacity, and enhanced reliability, resulting in fewer breakdowns and reduced maintenance frequency.
7	What type(s) of GHG emissions, and in what quantities (expressed in CO_2 equivalent), have been reduced under the current status of the mitigation measure?	It is planned to be commissioned in 2026.

8	What other socio-economic benefits are currently associated with the mitigation measure?	Its use for freight transportation along international transport corridors passing through the territory of Azerbaijan is expected to have a significant impact on the country's transit revenues. Increased fuel efficiency will also contribute to reducing operational costs.

2. Identification and Preparation for the Implementation of Energy Transition, Energy Efficiency and Decarbonization Measures at the Port of Baku

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing entity, coordination arrangements, all stages of implementation of the measure, etc.	Identification and Preparation for the Implementation of Energy Transition, Energy Efficiency and Decarbonization Measures at the Port of Baku. The measure is aimed at enhancing the environmental sustainability of the Port of Baku, improving energy efficiency and the management of energy consumption, and reducing greenhouse gas (GHG) emissions generated by port operations. With technical support from the RINA-HPC Consortium, the port's existing environmental and technical conditions, energy consumption, and energy management system were assessed, and priority areas for decarbonization and energy transition were identified. As part of the cooperation, analyses and discussions were conducted on the Energy Transition Plan, energy management system, Climate Strategy 2035, ISO 50001, Environmental Management System (EMS), and related digital solutions. **Responsible organization:** Baku International Sea Trade Port. **Technical support:** RINA-HPC Consortium, with the participation of representatives of the OSCE.
2	Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan in which it is implemented.	The measure relates to the transport and logistics, maritime port operations, energy efficiency, and decarbonization sectors. It is being implemented within the territory of the Port of Baku. The main feature is to identify measures to improve energy efficiency and reduce carbon emissions based on an assessment of the port's energy consumption and operational processes.
3	Status of the mitigation measure (implemented; currently under implementation; officially approved for implementation but not yet commenced; or in the planning stage without having been officially approved for implementation).	**Currently under implementation / being implemented in phases.** The initial assessment and technical support phase have been completed; priority decarbonization and energy transition areas have been identified, and technical support has been provided for planning the subsequent phases.

4	Implementation period of the mitigation measure (specifying the start and end years of implementation, including the exact timeframe for each phase, where applicable).	The measure is long-term in nature and is aligned with the energy transition and decarbonization objectives set out in the Baku Port Climate Strategy 2035.
5	Which type(s) of greenhouse gas (GHG) emission sources is the mitigation measure targeting, or which gases are involved in removals, and which gases, and in what quantities (expressed in total CO_2 equivalent), will be reduced as a result of the mitigation measure? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), or other emissions with indirect radiative effects (SO_2, NO_x, CO), etc.	The measure is primarily aimed at reducing CO_2 emissions arising from the port's energy consumption and operational activities. Reductions in both direct and indirect emissions are envisaged through improved energy efficiency, energy transition, and optimization of operational processes. As the current document does not specify a quantitative estimate of the CO_2 reductions expected to result from the measure, no specific figure in tons of CO_2 is provided. This figure should be determined based on calculations of baseline emissions and the selected mitigation measures.
6	What stages of the mitigation measure have been completed to date, what preliminary results have been achieved, and what source(s) of financing have been used (e.g., government funding, donor-funded projects, etc.)?	During the preparation and technical assessment phase, technical meetings were held with RINA-HPC specialists, the implementation plan was agreed upon, and data on the port's energy consumption, environmental management system, Climate Strategy 2035, ISO 50001, and digital systems were analyzed. The port's production and terminal infrastructure was assessed on site, and recommendations were developed on energy efficiency, decarbonization, energy transition, and digitalization. Representatives of the OSCE also participated in the process as part of the project.
7	What types of GHG emissions, and in what quantities (expressed in CO_2 equivalent), have been reduced under the current status of the mitigation measure?	As the measure currently covers assessment, planning, institutional capacity building, and the development of technical recommendations, no verified quantitative assessment of the emissions reductions realized to date has been done at this stage and will be submitted in the next BTR
8	What other socio-economic impacts are currently associated with the mitigation measure?	As a result of the measure, the Port of Baku's institutional capacity in the areas of environmental management, energy efficiency, decarbonization, and climate change adaptation has been strengthened. The identification of priorities under

		Climate Strategy 2035, the development of technical recommendations based on international best practices, and preparations for EcoPorts certification have contributed to enhancing the port's alignment with international environmental standards and its capacity to implement future sustainable investment projects.

3. Improving electrical energy efficiency (transition from DC to AC system)

3.1 transition from the conventional 3.3 kV direct current (DC) system to a 25 kV alternating-current (AC) system

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing entity, coordination arrangements, all stages of implementation of the measure, etc.	Improving electrical energy efficiency (transition from the conventional 3.3 kV direct current (DC) system to a 25 kV alternating-current (AC) system).
2	Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan in which it is implemented.	The measure envisages the transition from the conventional 3.3 kV direct current (DC) system to a 25 kV alternating current (AC) system, as well as the deployment of modern energy-efficient catenary system solutions, with the aim of improving energy efficiency in the railway electrification system. The measure relates to railway electrical infrastructure and catenary systems. It is planned to be implemented on the Bilajari–Yalama, Baku–Boyuk Kasik, Baku Circular, and Baku suburban railway lines.
3	Status of the mitigation measure (implemented; currently under implementation; officially approved for implementation but not yet commenced; or in the planning stage without having been officially approved for implementation).	For the Baku–Boyuk Kasik railway line, works to transition from the direct current system to the alternating current system have been completed on 3 of the 4 lots. The relevant design works for the Bilajari–Yalama railway line have been completed. For the Baku Circular and Baku suburban railway lines, implementation of the measure is currently at the design and planning stage.
4	Implementation period of the mitigation measure (specifying the start and end years of implementation, including the exact	The measure is planned to be implemented in phases during the strategic development period through 2030. Its implementation will be carried out in accordance with the schedules for the design, financing, and construction and installation phases of the respective railway lines. Within this

	timeframe for each phase, where applicable).	framework, the preparation and implementation of projects for the transition from direct current (DC) to alternating current (AC) systems on individual railway sections will continue in phases. The determination and phasing of the implementation period of the measure are related to the financing arrangements, loan projects and contractor agreements involving funds mobilized from external financial institutions, as well as the relevant investment and financing mechanisms. Therefore, the specific start and completion dates for individual projects will be determined in accordance with the applicable financing arrangements and contractual terms.
5	Which type(s) of greenhouse gas (GHG) emission sources is the mitigation measure targeting, or which gases are involved in removals, and which gases, and in what quantities (expressed in total CO_2 equivalent), will be reduced as a result of the mitigation measure? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), or other emissions with indirect radiative effects (SO_2, NO_x, CO), etc.	The transition from a direct current (DC) system to an alternating current (AC) system in the railway network, together with the introduction of a higher-voltage catenary system is expected to reduce electricity transmission loss, as well as lower electrical losses in the catenary and power supply components and improve overall energy efficiency. As a result, indirect CO_2 emissions associated with electricity generation will be reduced due to the lower amount of electricity required to perform the same transport work. The implementation of the measure will also contribute to reducing losses and energy consumption in the power supply system, lowering the carbon intensity of railway transport, and reducing total GHG emissions, expressed in CO_2 equivalent, over the long term.
6	What stages of the mitigation measure have been completed to date, what preliminary results have been achieved, and what source(s) of financing have been used (e.g., government funding, donor-funded projects, etc.)?	Works to transition from the direct current system to a 25 kV alternating current system have been carried out on 3 of the 4 lots of the Baku–Boyuk Kasik railway line. As a result of upgrading the power supply and catenary systems during these phases, energy efficiency has been improved and energy losses have been reduced. The measure has been financed through both government funding and funds from international financial institutions.
7	What types of GHG emissions, and in what quantities (expressed in CO_2 equivalent), have been reduced under the current status of the mitigation measure?	At the current stage, the mitigation measure is expected to result in a reduction in indirect CO_2 emissions through lower electricity consumption and reduced energy transmission losses. Although the transition of the Baku–Boyuk Kasik railway line to the 25 kV AC system has been implemented, the actual emissions reductions achieved to date have not yet been assessed in tons of CO_2 equivalent. The magnitude of the emissions reduction will be determined based on the actual energy savings achieved and the applicable electricity emission factor.

8	What other socio-economic impacts are currently associated with the mitigation measure?	Reduced energy and operating costs; improved reliability and efficiency of railway transport; increased freight and passenger transport capacity; expanded international transit and logistics opportunities; and contribution to the economic development of the regions.

3.2 Transition from conventional 10 kV power supply solutions to 35 kV power supply solutions

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing entity, coordination arrangements, all stages of implementation of the measure, etc.	Improving electrical energy efficiency (transition from conventional 10 kV power supply solutions to 35 kV power supply solutions).
2	Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan in which it is implemented.	The measure envisages the transition from the conventional 10 kV power supply system to a 35 kV power supply system for supplying railway stations, auxiliary systems, and signaling and communication systems on non-electrified railway lines, with the aim of improving energy efficiency in the railway electrical infrastructure. The measure relates to the electricity supply and power infrastructure and is intended to reduce energy losses and voltage drops along long-distance power supply lines.
3	Status of the mitigation measure (implemented; currently under implementation; officially approved for implementation but not yet commenced; or in the planning stage without having been officially approved for implementation).	The implementation of 35 kV power supply solutions is currently at the project preparation and design stage. For individual projects, 35 kV power supply solutions have been incorporated into the project documentation and planned for implementation.
4	Implementation period of the mitigation measure (specifying the start and end years of implementation, including the exact timeframe for each phase, where applicable).	The mitigation measure is planned to be implemented in phases during the strategic development period through 2030. The implementation timelines will be determined in accordance with the design, financing, and construction phases of individual projects, as well as the terms and conditions of financing and contractor agreements concluded, or to be concluded, with the government and foreign financial institutions.
5	Which type(s) of greenhouse gas (GHG) emission sources is the mitigation measure targeting, or which gases are involved in	The measure is primarily aimed at reducing indirect CO_2 emissions associated with electricity generation. The transition from 10 kV to 35 kV is expected to reduce technical losses and energy consumption in the electricity

	removals, and which gases, and in what quantities (expressed in total CO_2 equivalent), will be reduced as a result of the mitigation measure? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), or other emissions with indirect radiative effects (SO_2, NO_x, CO), etc.	network by enabling the transmission of the same amount of power at a lower current. As a result, it will contribute to reducing CO_2 emissions associated with electricity generation and overall GHG emissions expressed in CO_2 equivalent.
6	What stages of the mitigation measure have been completed to date, what preliminary results have been achieved, and what source(s) of financing have been used (e.g., government funding, donor-funded projects, etc.)?	Design work for the implementation of the above-mentioned solutions is currently underway for the Nakhchivan railway network. For the other non-electrified railway lines, contracts are currently being finalized to commence the relevant design works.
7	What types of GHG emissions, and in what quantities (expressed in CO_2 equivalent), have been reduced under the current status of the mitigation measure?	At the current stage, the actual CO_2e emissions reductions achieved through the implementation of 35 kV power supply solutions have not been separately quantified. The magnitude of the emissions reduction will be determined based on a comparison of the actual energy losses under the 10 kV and 35 kV configurations and the applicable electricity emission factor.
8	What other socio-economic impacts are currently associated with the mitigation measure?	Reduced energy and operating costs; improved reliability and quality of electricity supply; expanded long-distance power supply capacity; more efficient provision of energy to meet the demand of new and developing railway facilities; and optimization of operating costs. The application of a higher voltage level also enables a reduction in current for the same transmitted power and, consequently, lower network losses.

4. Use of solar energy and solar collectors for hot water production in Bilajari and Ganja locomotive repair depots

1	Name of the mitigation measure, detailed description, purpose, responsible organization,	Use of solar energy and solar collectors for hot water production. In 2021, 307 solar panels were installed at the Bilajari Locomotive Repair Depot, while in 2022, 210 solar panels and 140 solar collectors were installed at the Ganja Locomotive Repair Depot. The solar panels/energy systems are used to generate electricity from a renewable energy source, while the

	implementing entity, coordination arrangements, all stages of implementation, etc.	solar collectors are used to heat water using solar energy. The objective is to reduce dependence on conventional energy sources and, consequently, reduce greenhouse gas emissions. Responsible organizations and implementing units: Bilajari and Ganja Locomotive Repair Depots.
2	Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region or regions of the Republic of Azerbaijan where it is implemented?	The measure relates to the energy sector, specifically the use of renewable energy sources. It is implemented at the Bilajari Locomotive Repair Depot in Baku and at the Ganja Locomotive Repair Depot in Ganja.
3	Status of the mitigation measure (implemented; currently under implementation; officially approved for implementation but not yet commenced; or at the planning stage without having been formally approved for implementation).	Implemented and currently operational.
4	Implementation period of the mitigation measure (specifying the start and end years of implementation, including the exact timeline for each implementation phase, where applicable).	Bilajari Depot – since 2021; Ganja Depot – since 2022. The measure is intended to remain in continuous operation.
5	Which type(s) of greenhouse gas (GHG) emission sources is the mitigation measure intended to address, or which gases does the sequestration/removal relate to? At the end of the mitigation measure, which gases, and in what quantities (expressed in total CO_2 equivalent), will be	The measure is primarily aimed at reducing CO_2 emissions associated with energy consumption. The use of solar energy and solar collectors reduces reliance on conventional energy sources and consequently reduces associated emissions. During the operational period, the solar panels generated 370,105.61 kWh of electricity which enables to reduce GHG emissions by 139,159 tons CO2 eq.

	reduced as a result of the measure? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and other emissions with indirect radiative effects (SO_2, NO_x, CO), etc.	
6	Which stages of the mitigation measure have been completed to date, what initial results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?	Solar energy equipment has been commissioned and put into operation at Bilajari and Ganja depots. As a preliminary result, the use of renewable energy sources was provided, and the dependence on traditional energy sources was reduced due to the preparation of hot water through solar collectors. So far, 370,105.61 kWh of electricity has been obtained due to solar panels.
7	At its current stage of implementation, what types of greenhouse gas (GHG) emissions have been reduced as a result of the mitigation measure, and what is the volume of emissions reduced, expressed in CO_2 equivalent?	The mitigation measure has primarily resulted in a reduction of GHG emissions (CO2, CH4, N2O) totally by 139,159 tons CO2 eq.
8	What other socio-economic impacts or benefits have resulted from the mitigation measure to date?	Generally, the solar panels are used for water heating, they reduce the depot's reliance on conventional gas- or electricity-powered boilers. The measure has resulted in additional expenses spare and use them for other socio-economic purposes, as well as improvement of air quality.

5. Improvement of energy efficiency through procurement of new AZ4A-series

locomotives

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing institution, coordination arrangements, all stages of implementation of the measure, etc.	Renewal of rolling stock used for passenger rail transport and the introduction of modern, energy-efficient electric locomotives and electric trains. Under this measure, the rolling stock used for passenger services is to be gradually renewed. The procurement of AZ4A-series locomotives (France) has already been completed. In subsequent stages, the renewal of the locomotive fleet, procurement of new electric trains and locomotives, as well as the commissioning of new or reconstructed railway stations, are envisaged to expand the coverage and accessibility of passenger rail services. The main objectives of the measure are to improve energy efficiency in passenger rail transport, gradually replace ageing and more energy- and fuel-intensive rolling stock, and increase the share of rail transport in passenger transport.
2	Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region or regions of the Republic of Azerbaijan in which it is implemented.	The measure is a technological and structural mitigation measure aimed at reducing greenhouse gas (GHG) emissions in the transport sector. The relevant areas include railway transport, passenger transportation, railway rolling stock, energy efficiency, and transport infrastructure. The measure covers the areas of the Republic of Azerbaijan where passenger rail services are operated. Existing passenger routes include Baku, Sumgait, Ganja, Gabala, Gazakh, and other destinations. The regional coverage of the measure is expected to be expanded through the commissioning of new railway stations.
3	Status of the mitigation measure (implemented, currently under implementation, formally approved for implementation but not yet commenced, or at the planning stage without having been formally approved for implementation).	The procurement of AZ4A-series locomotives has been completed, and the locomotives have been put into service for passenger transportation. Further renewal of the locomotive fleet, procurement of new electric trains and locomotives, as well as the commissioning of new passenger railway stations, are planned in subsequent stages.
4	Implementation period of the mitigation measure (specifying the start and end years of implementation, including a clear breakdown by stages).	The mitigation measure is planned to be implemented in phases during the strategic development period up to 2030. The implementation timelines for individual components of the measure will be determined in accordance with the respective stages of procuring new rolling stock, renewing the existing fleet, and commissioning new railway stations.

5	Which types of greenhouse gas (GHG) emission sources is the mitigation measure targeted at, or which gases does the associated carbon removal/sequestration relate to? At the end of the mitigation measure, which gases, and in what quantities, are expected to be reduced, expressed in terms of total CO_2 equivalent (CO_2 eq.)? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), as well as other indirect emissions with climate impacts, such as SO_2, NO_x, and CO, etc.	The measure is primarily aimed at reducing CO_2 emissions associated both with replacement of outdated diesel consuming trains with energy efficient locomotives and energy consumption decease due to the brake energy recuperation as an energy efficiency mode. Therefore, along with CO2 emissions, it contributes to reductions in CH_4 (methane) and N_2O (nitrous oxide) emissions as a result of reduced fuel consumption. One of the key components of the measure is the gradual replacement of ageing diesel-powered rolling stock with modern, energy-efficient electric rolling stock. In addition, shifting passenger transport from road to rail is expected to contribute to reducing emissions in the transport sector. The introduction of AZ4A-series electric locomotives is supposed to improve both energy efficiency and operational efficiency. So. the main expected outcome of the measure is a reduction in CO_2 emissions, as well as CH_4 and N_2O emissions associated with fuel consumption.
6	What stages of the mitigation measure have been implemented to date, what initial results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?	The procurement of AZ4A-series locomotives has been completed, and the locomotives have been put into service for passenger transportation. This has expanded the use of modern electric traction technology and enabled the adoption of more advanced technologies to improve the operational and maintenance efficiency of the rolling stock. In subsequent stages, further renewal of the locomotive fleet, as well as the procurement of new electric trains and locomotives, is envisaged.
7	What types of GHG emissions, and in what quantities (expressed in CO_2 equivalent), have been reduced as a result of the mitigation measure at its current stage of implementation?	At the current stage, the mitigation measure's impact on GHG emissions reductions is primarily associated with the introduction of more energy-efficient rolling stock and the resulting reduction in energy and fuel consumption. This impact is expected to result primarily in reductions in CO_2 emissions and, indirectly, in reductions in CH_4 and N_2O emissions. Assessment of the emissions reductions requires a comparative assessment of energy or fuel consumption, operating distances, passenger volumes carried, and the relevant emission factors for the new and previous rolling stock, and will be done in the next BTR

8	What other socio-economic impacts does the mitigation measure currently have?	A number of positive socio-economic and environmental impacts are expected from the measure, including the providing passengers with more comfortable, safer, and modern transport options for passengers; helping to the optimization of travel times and transportation costs; enhancing interregional mobility; improving transport connectivity between Baku and the regions; and increasing the attractiveness of rail transport for passengers. The commissioning of new railway stations is expected to improve transport accessibility for surrounding communities, support economic activity and tourism development in the regions, and provide more accessible transportation options for persons with disabilities.

7.3.3. WATER TRANSPORT

A new International Sea Trade Port complex has been constructed in the Alat settlement of Baku city. Baku Port was awarded with the "EcoPorts" certificate by the European Sea Ports Organization in 2019. For this purpose, data collection on fuel consumption on ships with a total capacity of 5000 and more sailing under the flag of the Republic of Azerbaijan has been organized. The "Ship's Energy Efficiency Management Plan" of ships sailing under the state flag of the Republic of Azerbaijan are checked and approved by the State Maritime and Port Agency.

In line with the IMO Strategy**, Azerbaijan Caspian Shipping Company CJSC (ASCO)** implements the relevant mitigation measures for reducing its GHG emissions from international shipping activities by at least 20% by 2030, while pursuing efforts to achieve a 30% of reduction**,** as well as reducing emissions by 70% by 2040, while implementing measures to strive for an 80% reduction. Moreover, it has integrated its net zero emission target by 2050 into relevant "Energy Efficiency and Emissions Reduction Policy"**.**

Moreover, the "ASCO Strategy and Action Plan for Achieving the 2050 Zero-Emission Target in the Shipping Sector in **l**ine with the IMO Strategy for Addressing Climate Change" has been developed**.** The Strategy outlines ASCO's decarbonization measures across four phases. So, the first phase (2024–2027) primarily envisages the decommissioning of older vessels with lower energy efficiency and the acquisition of new, more energy-efficient vessels. The subsequent phases include the transition of the fleet to the use of alternative fuels. The first phase also envisages the use of technologies, systems and equipment aimed at improving energy efficiency. As a result of the mitigation activities during the first stage of the activity the reduction of the GHG emissions was by 38 Kt CO_2 eq. The first phase of the measure has been finished, covering **40 vessels**, while the second phase is currently under implementation, covering **62 vessels.** In the second stage the prognose scenarios provide 38 Kt CO_2 eq. reduction.

In addition, within the framework of cooperation with **QTAGG,** a company from the Kingdom of Sweden, the implementation of the **"EcoPilot" system** has started. The system has been installed as a pilot project on the **"Azerbaijan" RoPax-type ferry.** The EcoPilot technology supports the optimization of the vessel's route through an electronic system and enables automatic adjustment of its speed based on factors such as wind direction and strength, vessel characteristics, weather forecasts and sea currents. This contributes to a **5-7% reduction in emissions** through reduced fuel consumption, the detailed info will be provided in BTR3.

7.3.4. AIR TRANSPORT

Azerbaijan participates in the Carbon Offset and Reduction System for International Aviation (CORSIA) under the International Civil Aviation Organization (ICAO). Namely, the State Civil Aviation Agency (SCAA) under the Ministry of Digital Development and Transport of the Republic of Azerbaijan and aircraft operators of the Republic of Azerbaijan conducting international flights that fall within the scope of the CORSİA. CORSIA is a global market-based measure established by the International Civil Aviation Organization (ICAO) with the aim of contributing to the reduction of CO_2 emissions from international aviation. The mechanism provides for the monitoring, reporting and verification (MRV) of CO_2 emissions from international flights, as well as, where applicable, the fulfilment of their prescribed emissions offsetting obligations by airlines. CORSIA also enables the fulfilment of offsetting obligations through the use of eligible emissions units and CORSIA-eligible fuels within the framework of the Scheme. *The Republic of Azerbaijan is among the states that voluntarily participate in CORSIA.*

The primary objective of this measure is to contribute to reducing the impact of international aviation on climate change and to support the implementation of ICAO's long-term climate goals for international aviation.

Coordination Arrangements:

The implementation of CORSIA at the national level is carried out in accordance with the relevant ICAO Standards and Recommended Practices (SARPs), particularly the requirements of ICAO Annex 16, Volume IV. The SCAA ensures coordination with ICAO on CORSIA-related matters, as well as collection of emissions data submitted by aircraft operators, and transmission of the relevant information to ICAO. Where necessary, coordination is carried out with relevant government authorities, aircraft operators and other stakeholders.

Key Stages of implementation of CORSIA:

- Monitoring of fuel consumption and CO_2 emissions from international flights;
- Preparation of annual emissions reports by aircraft operators;
- Verification of emissions data by an accredited verification body;

- Submission of verified emissions data to the SCAA and transmission of the relevant information to ICAO on behalf of the government;
- Determination of CO_2 offsetting requirements for aircraft operators, where applicable, in accordance with ICAO CORSIA rules;
- Cancellation of the required emissions units for the relevant compliance period and/or consideration of the use of CORSIA-eligible fuels;
- Verification and reporting of compliance with offsetting obligations and submission of the relevant information to ICAO.

Intended Period of the mitigation policy:

The implementation of CORSIA monitoring, reporting and verification (MRV) requirements commenced in 2019. The implementation period for the offsetting of CO_2 emissions under CORSIA covers the years 2021–2035. The stages of the measure are as follows:

- 2019–2020 – Baseline and Initial Implementation Period: Monitoring, reporting and verification (MRV) of CO_2 emissions from international aviation;
- 2021–2023 – Pilot Phase: The pilot phase of offsetting within CORSIA; participation by States was on a voluntary basis;
- 2024–2026 – First Phase: Participation by States continues on a voluntary basis;
- 2027–2035 – Second Phase: The phase in which participation by States is expanded in accordance with the established CORSIA eligibility criteria.

  The stages already completed up to date and initial results are following:

Within the framework of the implementation of CORSIA in the Republic of Azerbaijan, a monitoring, reporting and verification (MRV) system has been established, and annual monitoring and reporting of CO_2 emissions from international flights have been carried out.

The Republic of Azerbaijan participated in the CORSIA Pilot Phase covering the period 2021–2023 and is currently continuing the implementation of the First Phase covering the period 2024–2026.

The following key results have been achieved within the framework of implementation:

- Fuel consumption and CO_2 emissions from international flights have been monitored;
- Annual emissions reports have been prepared by aircraft operators and verified by independent accredited verification bodies;
- Verified CO_2 emissions data have been collected at the national level and submitted to ICAO through the CORSIA Central Registry (CCR);
- An annual reporting mechanism under the CORSIA MRV system has been established and is continuously implemented;

- The necessary data infrastructure and reporting system have been established to support the determination of emissions offsetting requirements for the relevant phases of CORSIA.

CORSIA is not a separate investment or infrastructure project; rather, it is a global market-based mitigation mechanism for international aviation. The costs incurred by aircraft operators in connection with the implementation of CORSIA requirements, including costs related to emissions monitoring, preparation of reports, independent verification, and, where applicable, the acquisition of CORSIA-eligible emissions units, are primarily borne by the corresponding aircraft operators.

At the national level, the administrative implementation of CORSIA, as well as the related reporting and coordination activities with ICAO, are carried out within the framework of the existing institutional activities of the responsible government authority. No separate government investment project or donor-funded project has been envisaged as a source of financing for the implementation of CORSIA in Azerbaijan.

GHG Emissions Reduced/Offset to Date:

The main greenhouse gas covered by CORSIA is carbon dioxide (CO_2). The mechanism applies to CO_2 emissions generated by the combustion of aviation fuel during international flights.

During the CORSIA Pilot Phase covering the period 2021–2023, the level of CO_2 emissions covered by CORSIA from global international aviation remained below the applicable baseline level. Consequently, the Sector's Growth Factor (SGF) calculated by ICAO was 0 for each of the years 2021, 2022 and 2023, but in 2024 SGF was 0.15948. (For information, the Sector Growth Factor (SGF) is an indicator for calculating how much CO_2 airlines need to offset for international flights in order to be under the baseline (i.e. 85% of 2019 levels) CO2 emissions level. For instance, if calculated annual SGF is determined as 10% in the year X, then it means that the international aviation produced about 10% more CO_2 than the baseline in X.)

As a result, no emissions offsetting obligation arose for aircraft operators under CORSIA during 2021-2023. For this reason, the volume of emissions offset under CORSIA for aircraft operators of the Republic of Azerbaijan during the Pilot Phase (2021–2023) is assessed as "0 ton of CO_2 (0 tons of CO_2e)". Currently, the First Phase of CORSIA, covering the period 2024–2026, is ongoing. The final volume of emissions subject to offsetting for this phase will be determined based on the results of the relevant reporting and compliance period.

At the current stage, the **250 Kt CO_2 eq. emissions offsetting planned for 2028 has not yet been implemented.** The actual quantity of emissions offset will be determined following the **purchase and cancellation of eligible carbon units.**

Current Socio-Economic Effects of the Mitigation Measure:

The implementation of CORSIA, in addition to increasing environmental responsibility within the international aviation sector, generates a range of institutional, technical and economic impacts.

The main positive socio-economic effects at present are as follows:

- Strengthening the institutional and technical capacity of aircraft operators and relevant government authorities in the area of monitoring, reporting and verification (MRV) of CO_2 emissions;
- Developing knowledge and professional skills in emissions registration, data quality management and independent verification within the aviation sector;
- Strengthening corporate approaches to environmental responsibility and carbon emissions management in the international aviation sector;
- Creating economic incentives for the use of CORSIA-eligible emissions units and CORSIA-eligible fuels;
- Creating market and institutional incentives for the future introduction and use of lower-carbon aviation fuels and sustainable aviation fuels (SAF);

At the same time, implementation of the CORSIA requirements have generated additional compliance costs for aircraft operators associated with MRV, independent verification and, where applicable, emissions offsetting

Actually, the main socio-economic impacts of CORSIA could be characterized by strengthening institutional capacity and professional expertise in the aviation sector, improving emissions management systems, enhancing environmental responsibility, and creating economic incentives for the transition to low-carbon technologies and fuels.

Azerbaijan also joined ICAO's Action Plan for Emission Reduction (APER).

Plans are in place to renovate the fleet with modern and efficient aircraft, as well as to increase the use of biofuels. Here's some concrete mitigation measures:

1. **Fleet Modernization**

Objective. Reduction of aviation fuel consumption and CO_2 emissions through the introduction and operation of newer and more fuel-efficient aircraft.

Responsible organization, implementing body, and coordination issues is **Azerbaijan Airlines CJSC.**

Description. This is a mitigation measure in the **civil aviation and air transport sector.** The measure covers AZAL's domestic and international flight operations. The renewal of the fleet is being carried out in phases, with new Airbus A320neo and A321neo aircraft being added to the fleet each year during **2022–2032.** The measure is being implemented in phases, with the introduction of new-generation aircraft into the fleet and the gradual replacement of less fuel-efficient aircraft planned throughout this period. The measure is financed through the **own funds of Azerbaijan Airlines CJSC.**

Emission reduction effect (in CO2 eq.): Based on an analysis of the operation of new-generation NEO aircraft, an average reduction of approximately **16% in fuel consumption and CO_2 emissions** has been achieved compared with the base year (2019) fleet. This corresponds to an estimated reduction of approximately **9.198 Kt CO_2 eq. emissions.**

Other socio-economic and international cooperation contributions including SDGs implementation - Fleet modernization contributes to **reducing fuel costs, improving operational efficiency, optimizing maintenance costs, and enhancing service quality** through the operation of more modern aircraft. At the same time, the use of newer-generation aircraft has a positive impact on reducing **noise and other local air pollutants.**

2. Use of Sustainable Aviation Fuel (SAF)

Increasing the use of Sustainable Aviation Fuel (SAF).

Objective. Increasing the use of Sustainable Aviation Fuel (SAF).

Responsible organization, implementing body, and coordination issues is Azerbaijan Airlines CJSC ***(AZAL)***

Description. Reduction of aviation-related CO_2 eq. emissions and carbon intensity by replacing a portion of conventional aviation fuel with SAF, which has lower life-cycle emissions. This is a mitigation measure in the **civil aviation and air transport sector.** The measure primarily covers AZAL's flight operations from **airports in the European Union.** Since 2025, AZAL has commenced the use of a **2% SAF blend** on flights operated from the European Union, with a phased increase in SAF use planned. The use of SAF has been gradually increased in the flight operations since 2025 and will be continued up to 2050. The measure is financed through the **own funds of Azerbaijan Airlines CJSC.**

Emission reduction effect (in CO2 eq.): The measure is aimed at reducing **life-cycle CO_2 eq. emissions from aviation fuel use.** The phased increase in SAF use is one of the key measures contributing to AZAL's decarbonization strategy and its target of achieving a **30% reduction in total emissions by 2050. Since, a**s a result of using a **2% SAF blend** on flights operated from the European Union since 2025, an estimated reduction of approximately **785 tons CO_2 eq. emissions** has been achieved.

Other socio-economic and international cooperation contributions including SDGs implementation – the measure is aimed at reductio of GHG emissions and other pollutants. Moreover, the use of SAF accelerates AZAL's transition toward **low-carbon aviation,** promotes the adoption of cleaner fuel technologies in the aviation sector, and contributes to the implementation of the company's long-term decarbonization strategy. The measure also strengthens AZAL's alignment with **international environmental and carbon-related requirements.**

7.3.5. ROAD INFRASTRUCTURE

The reduction of heat-producing gases has been achieved due to the reconstruction and major repair of roads, the construction of road junctions at different levels, underground and surface pedestrian crossings, the elimination

of traffic jams and the increase of the average speed of vehicles. Also, green belts (zones) have been built along roadways.

When designing and constructing roads, the degree of its impact on the environment is determined, the compatibility of the road with the landscape is taken into account and project solutions with the least impact on the environment are preferred. Green belts are established along roadways, contributing to waste reduction.

7.3.5.1. BAKU METRO

The Closed Joint-Stock Company "Baku Metropolitan" (or Baku Metro) is permanently implementing policies and series measures aimed at reduction of the environmental impacts of its operations, including GHG emission mitigation measures, such as expansion of renewable energy use and increasing energy efficiency of the operations. For instance, under the Clause 4.1.3.2 of the "State Program for 2025–2030 on the Improvement of Transport Infrastructure in Baku City and Surrounding Areas" it is determined an objective of supporting environmentally friendly modes of transport aiming to maintain annual CO_2 emissions per capita below 600 kg. In this regard, the development of the Baku Metro as an environmentally friendly mode of public transport and strengthening its role within the urban transport system are of significant importance in contributing to the achievement of this target.

With the aim of establishing a systematic approach to decarbonization and energy efficiency in the Baku Metro, the implementation of the Asian Development Bank's technical assistance project, "Decarbonization of the Baku Metro for Smart and Sustainable Urban Transport of the Future" is supposed to start in the second half of 2026. The implementation of the project is supported by Order No. 278s of the Cabinet of Ministers of the Republic of Azerbaijan dated 28 April 2026.

The main objective of the project is to assess current energy consumption and GHG emissions in the Baku Metro, identify the potential for GHG emissions reductions, and develop a long-term decarbonization roadmap. Within the framework of the project, the potential for the application of energy efficiency measures, renewable energy sources, digital energy management, smart operational systems, and other low-carbon solutions will be assessed. The project also envisages identifying priority measures, preparing the relevant justifications for their implementation, and developing a three-year action plan.

Moreover, the Baku Metro's "Environmental Protection Policy," adopted in 2026, establishes key areas of action aimed at reducing the impacts of climate change and the carbon footprint, ensuring the efficient use of energy and resources, and minimizing impacts on ambient air quality. In accordance with the requirements of the **ISO 14001:2015** standard, the Policy reflects the

identification of environmental aspects, monitoring and evaluation of relevant indicators, and the development of programs and measures.

Information on mitigation measures that have already been implemented or are currently being implemented is presented separately in the tables below. Where applicable, the potential impact of these measures in terms of energy savings and GHG emissions reductions is also indicated. Measures are taken to expand the use of metro transport to mitigate climate impacts—new stations are construct-ed and modern railroad cars (carriages) are purchased and so on. The Conceptual Development Plan of Baku Metro envisages the phased expansion of the existing network of Baku Metro. The target is to increase the number of lines to 5, the number of stations to 76, and the total length of tracks to 119 kilometers. Furthermore, the distance between each station is designed to be 900 meters, with platforms accommodating seven-car trains.

Asian Development Bank Technical Assistance Project on "Decarbonizing the Baku Metro for Smart and Sustainable Urban Transport of the Future"

1	Name and detailed description of the mitigation measure, its objective, responsible organization, implementing entity, coordination arrangements, all stages of implementation, etc.	Preparation of a decarbonization and energy efficiency roadmap for the Baku Metro under the Asian Development Bank's (ADB) technical assistance project. The project covers the assessment of current energy consumption and GHG emissions, identification of energy efficiency measures, renewable energy opportunities, and digital energy management solutions, preparation of feasibility studies for priority investments, and development of a three-year action plan.
2	Characteristics of the mitigation measure, the sector(s) to which it relates, and the region(s) of the Republic of Azerbaijan where it is or will be implemented.	Transport sector – rail-based public transport; Baku City. Key areas of focus include improving the efficiency of electricity use, energy infrastructure, metro operations, and renewable energy.
3	Status of the mitigation measure (implemented; currently being implemented; officially approved for implementation but not yet commenced; or at the planning stage without having been officially approved for implementation).	Currently being implemented. The main analytical and technical activities under the project are scheduled to be carried out in the next stages.

4	Period for which the mitigation measure is envisaged (start and end years of implementation, with specific timeframes indicated for each stage).	The project is being implemented for a 64-week period in 2026–2027: • 2026: Initial stage and preparation of the Inception Report (Weeks 1–4) • Detailed assessment and preparation of the Decarbonization Roadmap (Weeks 5–30) • Start of the preparation of the feasibility study (Weeks 27–46) • 2027: Completion of the feasibility study and preparation of the three-year action plan (Weeks 47–50) • Capacity building and development of knowledge products (Weeks 51–62) • Finalization and project closure stages (Weeks 63–64)
5	Which type of greenhouse gas (GHG) emission sources is the mitigation measure targeted at, or which gases are relevant to the removals, and which gases, and in what quantities (expressed in total CO_2 equivalent), will be reduced as a result of the mitigation measure by the end of its implementation? *GHGs include: Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), as well as other indirect greenhouse gas emissions (SO_2, NO_x, CO), etc.*	Primarily focused on reducing CO_2 emissions. Within the framework of the project, the baseline, carbon footprint, emissions intensity, and the emissions reduction potential of individual measures are currently being calculated.
6	Which stages of the mitigation measure have been completed to date, what preliminary results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?	Under the Asian Development Bank's (ADB) technical assistance, the project's kick-off phase is envisaged to be implemented. In the next stage, data collection, baseline assessment, energy and carbon assessments, and the preparation of the decarbonization roadmap and feasibility study are envisaged.

7	At its current status, what types and quantities of GHG emissions (in CO_2 equivalent) has the mitigation measure resulted in reducing?	As the project is currently at the initial stage, the quantitative assessment of GHG emissions reductions is supposed to be carried out during next stages, based on an analysis of baseline indicators for energy consumption and GHG emissions, as well as an assessment of the relevant mitigation effect.
8	What other socioeconomic effects of the mitigation measure are currently being observed?	The expected socio-economic effects of the measure include the optimization of energy and operational costs, strengthening energy security and resilience, prioritization of investments, enhancement of institutional capacity, and support for low-carbon urban mobility.

7.3.6. SUSTAINABLE URBAN MOBILITY IN AZERBAIJAN

The project "Sustainable urban mobility in Azerbaijan" started with the involvement of the international consulting company (ICC). The goal of the project is to transform Baku into a "20-minute" city by 2030. All organizations included in the transport-road complex, as well as relevant state institutions, are involved in the implementation of the project. The project is organized on the basis of the following three principles:

- Getting results rapidly. First of all, increasing the attractiveness of public transport.
- Decision-making through Digital Twin Technology. Digital twin is a simulation model that allows to forecast passenger and transport flows, assess travel time reductions and make optimal decisions on the development of transport infrastructure. A "digital twin" modeling tool has been created and is already being used in the evaluation of certain infrastructure projects.
- Involvement of state bodies and other stakeholders. Creation and implementation of an effective management mechanism for project implementation. The newly created "Transport Coordination Council" plays a crucial role in this approach.

7.3.6.1. TRANSPORT COORDINATION COUNCIL

As part of its activities, the Transport Coordination Council has initiated pedestrianization of historically significant streets in downtown Baku, as well as is seeking ways to restrict traffic in certain streets of the city center on week-ends.

Relevant reconstruction works are being carried out for effective use of transport in the Transport Exchange Centers, mainly located in front of the metro stations, where access to other transport, except for public transport and taxis, is restricted.

To establish micro-mobility infrastructure in Baku city, the project of building 17 km of bicycle paths/lanes, primarily in the central part of the city, has been started by the decision of the Council.

As part of the implementation of the Decree of the President of the Republic of Azerbaijan dated 7 March 2024 on "Sustainable Urban Mobility in Azerbaijan" and the promotion of the use of electric motor vehicles, charging stations will be installed for the power supply of 160 buses to be brought to Baku in 2024 for operation in the city of Baku at the bus depot located in the city of Zigh for overnight charging of electric buses, as well as for the avail-ability of daytime charging at 4 Transport Interchange Centers, which are the last stops of the route lines.

To increase the use of electric vehicles, efforts are underway to install 77 electric vehicle charging stations (EVCSs) in Baku city and surrounding areas, 70 EVCSs in the districts and 20 in the Karabakh region.

The use of electric buses in public transport is projected to rise significantly, with plans for 500 electric buses in 2025 and 1,100 in 2026.

At the same time, drafts of relevant legal acts have been prepared, which envisage free use of paid parking spaces for electric vehicles, obtaining the right to move in special bus lanes and tax exemptions for individuals selling electricity through charging stations for electric vehicles (including any services provided to customers as a result of the execution of this activity).

Within the framework of the implementation of the Decrees of the Cabinet of Ministers of Azerbaijan Republic dated January 20, 2024 "On measures related to the modernization of the bus fleet at the expense of local production", a Framework Agreement was signed with the Chinese company "BYD Company Limited" (BYD) for the supply of the bus fleet at the expense of local production in our country. The annual production capacity of the new facility is expected to be 500 buses.

"Preparation of the National Plan for Electromobility" provided for in the "Socio-Economic Development Strategy of the Republic of Azerbaijan in 2022-2026" is being carried out and to increase the participation of banks in the financing of environmentally friendly vehicles, the "Roadmap for 2024 on the stimulation of circulation of environ-mentally clean and safe vehicles and the improvement of infrastructure" approved by the Commission for Business Environment and International Ratings,

envisages the allocation of loans on preferential terms by the Central Bank or the formation of other support mechanisms, the application of the leasing mechanism in the financing of environmentally friendly vehicles.

7.4. MITIGATION POLICIES AND MEASURES IMPLEMENTED IN THE AFOLU SECTOR

The AFOLU sector has a key role in achieving national goals for climate change mitigation and adaptation, as well as in reducing negative impacts on developing economies. In addition, it contributes to many of the Sustainable Development Goals adopted in 2015 and plays a fundamental role in business development.

In Azerbaijan, the AFOLU sector has an exceptional role in combating climate change, as its mitigation potential includes both enhancing carbon absorption and reducing emissions through effective land and livestock management.

However, challenges such as unsustainable forest management, deforestation, land degradation, and wildfires in the AFOLU sector cause emissions. Forests are among Azerbaijan's most valuable natural resources, covering an area of 1,040.2 thousand hectares, which accounts for 12% of the country’s territory.

In 2015-2022, various measures were implemented to mitigate the effects of climate change in the AFOLU sector, which had been identified as a priority in Azerbaijan's Nationally Determined Contributions.

Institutional mechanisms, political documents and legislation to support measures in combating climate changes within the AFOLU sector do not yet meet modern requirements. It is also worth noting that the main state bodies responsible for the AFOLU sectors have not established departments to address climate change. The Strategic Roadmap for the production and processing of agricultural products in the Republic of Azerbaijan outlines targets for reducing GHG emissions in the agricultural sector through the collection of methane gas from manures

formed in livestock and poultry farms and the spread of perennial crops, aligning with the goals of the sector in question of the NDC. Moreover, the document adjusted to NDC recommends the use of alternative energy sources in the heat supply of greenhouses, the establishment of protective forest strips, the use of plant species with economic importance (olives, almonds, pistachios, pomegranates, mulberries, figs, etc.) in the establishment of greenery and the improvement of pasture management-all contributing directly to the carbon sequestration potential of forests and grasslands.

The "State Program for socio-economic development of the regions of the Republic of Azerbaijan in 2019-2023", which was adopted later, continues to support the implementation of the AFOLU by facilitating the application of modern agricultural technologies and technical equipment, promoting the production of eco-friendly agricultural products and encouraging more efficient use of natural resources while protecting the environment. Besides, measures such as the creation and expansion of agro-parks for various plants and livestock, the establishment of new agroforestry massifs and forest plantations in cities and roadsides, including honey forests, provided for in the Action Plan, support the reduction of the sector's GHG emissions in line with the NDC of the AFOLU sector.

The AFOLU sector is focused on increasing absorption in 6 land types, divided into forest areas, croplands, grass-lands (pastures), wetlands, residential areas and other lands based on GHG classification, as well as reducing emissions resulting from deforestation and forest degradation.

In parallel, the activities on the protection and sustainable development of forests in Azerbaijan are currently implementing. In Azerbaijan, millions of seedlings (including forest and fruit trees) are cultivated annually to support afforestation, reforestation and forest restoration efforts. In addition, it should be noted that there has been a significant increase in the planting of fruit orchards on lands suitable for agriculture recently. Between 2010 and 2017 alone, more than 60,000 ha of new orchards were planted with productive tree species in Azerbaijan. For example, hazel-nut orchards were expanded from 34,000 ha to 80,000 ha. Moreover, starting in 2001, there has been a growing trend of cultivating

young trees on forest fund lands, which then were included in the category of valuable forests. Both in the orchards and in the agroforestry zones, productive fruit tree species such as olives, walnuts, almonds, hazelnuts, mulberries, unabi (jujube), pomegranates, chestnuts and pistachios are planted. At the same time, the development of sericulture is one of the priority directions in Azerbaijan, which is directly related to the expansion of mulberry orchards. In this regard, between 2016 and 2018 alone, 5,553,890 mulberry seedlings were planted in forest and non-forest areas.

Here's some mitigation measures started since 2022 and later and being actually implemented:

Mitigation Measures №1

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing organization, coordination arrangements, all stages of the measure, etc.	Name: Utilization of Agricultural Waste for Energy Purposes, Manure Composting and Biogas Production Objective: Efficient waste management, production of organic fertilizer and alternative energy. Responsible: Ministry of Agriculture, Ministry of Energy, private sector
2	**Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan where it is implemented**	The Aran economic region is considered to have the highest potential for biogas production.
3	**Status of the mitigation measure** (implemented, currently being implemented, officially adopted for implementation but not yet commenced, or at the planning stage without having been officially adopted for implementation)	In accordance with Order No. F-101 of the Ministry of Energy of the Republic of Azerbaijan dated 11 October 2022, a Working Group was established, comprising, among others, representatives of the Ministry of Agriculture. The Working Group was tasked with carrying out activities in the following areas: assessing the potential for bioenergy across the country, including

		agricultural residues, forestry residues and wood-processing waste; municipal solid waste; and biogas produced from animal manure and domestic wastewater; developing a regulatory and legal framework for the efficient and safe use of biogas and biomethane in industry and households, including the development of measurement methodologies and procedures for obtaining permits; exploring opportunities for localized electricity generation from biogas within the "Green Energy Zone" and preparing project proposals; drafting regulatory and legal acts that will constitute the legal framework for the implementation of bioenergy projects; preparing proposals to attract investment from local and international organizations and institutions for the implementation of such projects; and developing proposals for establishing a system to monitor and record the dynamics of bioenergy use across the country, among other activities. Work in this area is ongoing. In addition, within the framework of the 11th project call announced in 2024 by the Project Funding Mechanism of the Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (COMCEC), the "Climate-Smart Agriculture (CSA)" project submitted by the Agricultural Credit and Development Agency under the Ministry of Agriculture of

		the Republic of Azerbaijan was approved as a successful project. Within the framework of this project, an experience-sharing programme was organized among agricultural experts from Azerbaijan and Türkiye with the aim of reducing the adverse impacts of global climate change on agricultural productivity, food security and the living standards of rural populations; facilitating discussions on the application of innovative tools used in international practice; and conducting field visits to relevant areas. As part of the programme, representatives of the Ministry of Agriculture visited Ankara, Republic of Türkiye, from 4 to 11 August 2024. The main focus of the discussions was to examine the risks currently posed by climate change to Türkiye's agricultural sector, the measures being implemented in the sector to adapt to climate change and mitigate its impacts, and to strengthen cooperation for the application of successful practices in Azerbaijan's agricultural sector. In Azerbaijan, relatively low energy prices limit the economic viability of biogas production projects and make their widespread application economically less attractive at the current stage.
4	**Period for which the mitigation measure is planned** (specifying the start and end years of implementation, as	Although the implementation of the project was planned to commence in 2024,

	well as the exact timeframe for each stage, where applicable)	negotiations and discussions were held with the relevant stakeholders regarding the project; however, its practical implementation has not yet commenced.
5	What type of greenhouse gas (GHG) emission sources is the mitigation measure aimed at, or which gases does the absorption relate to? At the end of the mitigation measure, which gases and in what quantity will be reduced (expressed in total CO_2 equivalent)? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and other indirect greenhouse gas emissions (SO_2, NO_x, CO), etc.	Reduction of methane (CH_4) emissions
6	**What stages of the mitigation measure have been implemented to date, what preliminary results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?**	In 2024, online meetings were held between the Ministry of Agriculture of the Republic of Azerbaijan and the Ministry of Energy, during which a number of issues were discussed. Work with public and private sector entities on the implementation of the biogas project is currently ongoing. Financing: Financial support from the government and potential investors is planned.
7	**Under the current status of the mitigation measure, what types of GHG emissions have been reduced and by what amount (in CO_2 equivalent)?**	A reduction in CH_4 and N2O emissions is expected.
8	**What other socio-economic impacts have resulted from the mitigation measure to date?**	Waste will be utilized efficiently, soil fertility will be improved, the use of chemical (mineral) fertilizers will be reduced, and alternative energy sources will be developed.

Mitigation Measures №2

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing organization, coordination arrangements, all stages of the measure, etc.	**Title:** Subsidization and Promotion of the Establishment of Wind-break Forest Strips and Perennial Fruit Orchards **Objective:** Soil protection and increasing carbon sequestration.
2	**Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan where it is implemented**	Crop production and forestry; regions across the country
3	**Status of the mitigation measure** (implemented, currently being implemented, officially adopted for implementation but not yet commenced, or at the planning stage without having been officially adopted for implementation)	**Currently being implemented**
4	**Period for which the mitigation measure is planned** (specifying the start and end years of implementation, as well as the exact timeframe for each stage, where applicable)	Ongoing from 2025
5	What type of greenhouse gas (GHG) emission sources is the mitigation measure aimed at, or which gases does the absorption relate to? At the end of the mitigation measure, which gases and in what quantity will be reduced (expressed in total CO_2 equivalent)? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and other indirect greenhouse gas emissions (SO_2, NO_x, CO), etc.	Reduction of CO_2 emissions
6	**What stages of the mitigation measure have been implemented to date, what preliminary results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?**	By a decision of the Agricultural Subsidies Council on the subsidy mechanisms for 2026, the establishment of field shelterbelts has also been included in the state support mechanism. For field shelterbelts established between 1 September 2025 and 31 May 2026, the subsidy amount has been set at AZN 1,000 per hectare of shelterbelt area, with a minimum of 1,500 seedlings per hectare. Source of financing: Subsidized through the state budget.

7	**Under the current status of the mitigation measure, what types of GHG emissions have been reduced and by what amount (in CO_2 equivalent)?**	A reduction in CO_2 emissions is expected.
8	**What other socio-economic impacts have resulted from the mitigation measure to date?**	Soil degradation is reduced, and productivity increases

Mitigation Measures №3

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing organization, coordination arrangements, all stages of the measure, etc.	Name: Subsidization of the Establishment of Intensive and Super-Intensive Fruit Orchards Objective: To increase perennial plant cover and biomass, strengthen the resilience of agricultural production, and facilitate carbon sequestration in plant biomass and soil. According to the decision of the Agricultural Subsidies Council for 2026, planting subsidies have been established for intensive and super-intensive fruit orchards established between 1 September 2025 and 31 May 2026. The subsidized orchards include, among others, hazelnut, pomegranate, olive, lemon, kumquat, mandarin, orange, peach (nectarine), apricot, pistachio, pear, apple, cherry, persimmon, almond, walnut, chestnut, kiwi, raspberry, currant, blackberry, and blueberry orchards. Responsible Organization: Ministry of Agriculture of the Republic of Azerbaijan.

		Implementation and Application of the Subsidy Mechanism: Agricultural Credit and Development Agency. Coordination: Cooperation with relevant government agencies and agricultural producers in relation to the subsidy mechanism.
2	**Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan where it is implemented**	The measure applies to the agricultural sector, particularly crop production and horticulture. It is an indirect mitigation measure that facilitates carbon sequestration in biomass and soil through perennial crops. Support for intensive fruit production in 2026 covers the entire territory of the country. In addition, special subsidy conditions have been established for certain types of orchards in the liberated territories and the Nakhchivan Autonomous Republic.
3	**Status of the mitigation measure** (implemented, currently being implemented, officially adopted for implementation but not yet commenced, or at the planning stage without having been officially adopted for implementation)	Currently being implemented. The subsidy mechanism for the measure for 2026 has been officially established and is being applied. The implementation status of individual orchards is assessed separately based on producers' applications and actual planting activities.
4	**Period for which the mitigation measure is planned** (specifying the start and end years of implementation, as well as the exact timeframe for each stage, where applicable)	Implementation Period for 2026: Orchards established between 1 September 2025 and 31 May 2026. Stages: Identification of the land plot and orchard model;

		Planting of seedlings and installation of the irrigation system; Agro-technical maintenance; Fulfilment of the established eligibility requirements for receiving the subsidy and disbursement of the subsidy.
5	What type of greenhouse gas (GHG) emission sources is the mitigation measure aimed at, or which gases does the absorption relate to? At the end of the mitigation measure, which gases and in what quantity will be reduced (expressed in total CO_2 equivalent)? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and other indirect greenhouse gas emissions (SO_2, NO_x, CO), etc.	The main mitigation effect is associated with the removal of carbon dioxide (CO_2) from the atmosphere and the accumulation of carbon in the biomass of trees and other perennial plants, as well as in the soil. The establishment of orchards can be considered a measure primarily aimed at CO_2 removal/carbon sequestration rather than directly reducing CO_2 emissions. Based on the currently available information, the total amount of CO_2 equivalent reduction or removal expected by the end of the measure will be determined. Its calculation requires data on the area of the orchards, plant species, age of trees, biomass growth, changes in soil carbon stocks, and other monitoring data.
6	**What stages of the mitigation measure have been implemented to date, what preliminary results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?**	For 2026, a mechanism has been established for providing planting subsidies for the establishment of intensive and super-intensive orchards. At the initial stage, the mechanism envisages the establishment of various fruit and berry orchards, the use of modern/drip irrigation systems, and the application of requirements concerning certified seedlings. Source of financing: Agricultural subsidies

		financed from the state budget.
7	**Under the current status of the mitigation measure, what types of GHG emissions have been reduced and by what amount (in CO_2 equivalent)?**	The decision of the Agricultural Subsidies Council determines the subsidy amount and the conditions for establishing orchards. Additional calculations are required to determine and report a quantified CO_2 equivalent indicator.
8	**What other socio-economic impacts have resulted from the mitigation measure to date?**	The socio-economic impacts of the measure include the development of agricultural production and intensive horticulture, the potential to increase farmers' incomes, the expansion of employment and agricultural economic activity in rural areas, increased fruit and berry production, more efficient use of land, and wider adoption of irrigation technologies. The establishment of orchards can also contribute to soil protection and enhance the climate resilience of agroecosystems through increased perennial vegetation cover.

Moreover, the relevant state programs have been designed to support the development of afforestation and reforestation projects (planting of fast-growing trees, restoration and expansion of primary forests, and introduction of agroforestry practices). To plant new forest areas and orchards in this area, breeding of high-quality forest and fruit seedlings will be continued.

Overall, in the last 15 years, measures have been taken in the direction of afforestation, afforestation, and forest restoration in the area of 165.2 thousand hectares. To speed up the ongoing efforts, Azerbaijan joined the Bonn Challenge,

pledging to restore 270 thousand hectares of forest area by 2030. Of this, 170,000 hectares are to be implemented by the country itself, while 100,000 are expected to be realized through international assistance.

7.5 MITIGATION POLICIES AND MEASURES IMPLEMENTED IN THE WASTE SECTOR

“Tamiz Shahar" OJSC, established by Decree No. 2983 of the President of the Republic of Azerbaijan dated August 6, 2008, "On the improvement of municipal waste management in Baku city", deals with the disposal and neutral-ization of solid municipal waste.

One of the significant fields of the company is the Balakhani landfill for urban waste management.

The landfill was rehabilitated and transformed into a sanitary landfill as part of the "Integrated Solid Waste Management" project, operating on the basis of a loan agreement between the Ministry of Economy and the World Bank. The total area of the landfill is 120 ha.

As a result of the implemented work, the soil cover has been applied to nearly 60 hectares, with a total area of 2.9 million m² covered by specific (geogrids, geotextiles, geomembranes, etc.) isolation layers. In total, 26 special cells have been built for the disposal of waste at the landfill, allowing for the treatment of approximately 10 million tons of waste. At the same time, a reverse osmosis system has been installed for the treatment of leachate (waste water) collected at the landfill. Here, the treated leachate is converted into technical water for irrigation through special filters. There is obtained electric energy from biogas produced by the decomposition of organic waste through a special generator with a capacity of 2 MW/h. The area has also undergone greening efforts to prevent erosion and improve the landscape, with over 14,000 trees planted. To minimize the impact on the environment, samples are regularly taken from the surface soil, water and air at the landfill and analyzed in the appropriate laboratory. As per the results of the analysis, the impact parameters in the area have improved significantly in terms of quantity.

On November 30, 2023, as part of the Balakhani landfill project, a purchase agreement was signed with B.B Energy (ASIA) PTE LTD of “Tamiz Shahar OJSC” for emission reductions.

Within the framework of the "Comprehensive Action Plan for the Improvement of the Environmental Situation in the Republic of Azerbaijan for 2006-2010" approved by the Decree of the President of the Republic of Azerbaijan dated September 28, 2006, a contract was signed on December 15, 2008, between the Ministry of Economy and the French company "Constructions Industrielles de la Méditerranée S.A." (CNIM S.A.) for the construction of a solid municipal waste incineration plant in Baku. The annual incineration capacity of the plant is 500,000 tons of solid municipal waste and 10,000 tons of medical waste, generating up to 200 million KWh of electricity annually, which is transmitted to the general network of Baku through high-voltage lines. The plant started operating in December 2012.

Recognizing the significance of waste sorting in waste management, special attention was paid to taking appropriate measures in this direction. In order to sort municipal waste and develop recycling business in the country, a semi-automatic solid municipal waste sorting plant with an annual capacity of 200,000 tons was built in Balakhani using German technology. As a result of sorting at the factory, there are separated recyclable materials such as paper, glass, plastic, metal and other raw materials, which reduce the overall volume of waste, form a market for cheap raw materials and establish a foundation for developing recycling sectors in the country, save energy and most importantly, minimize the negative impact of waste on the environment.

Meanwhile, the Balakhani industrial park was established with the aim of developing recycling in the country.

The measures aiming to improve waste management, expand the scope of waste collection services and reduce the harmful effects of waste on the environment are of particular importance. As part of the Integrated Solid Waste Management Project, the current situation has been evaluated to implement a unified waste management system across the country and proposals for creating a network of regional sanitary landfills and transmission stations for the establishment of a system of transport, collection and neutralization for the sustainable management of municipal solid waste in urban and rural areas, as well as recommendations for phased legal, administrative, financial, institutional and technological reforms have been prepared. Based on these recommendations, the "National Strategy for the Improvement of Solid Waste Management in Azerbaijan for 2018-2022" was developed and adopt-ed.

According to the Decree of the President of the Republic of Azerbaijan No. 2701 dated June 22, 2021, "On the regulation of some issues in the field of municipal waste management" and "On making amendment

to Decree No. 2983 of the President of the Azerbaijan Republic" "On improving the municipal waste management in the city of Baku" dated August 6, 2008, the scope of activity of "Tamiz Shahar" OJSC was expanded and the collection, transportation, placement and neutralization of all solid municipal waste in the territory of Shusha city, which was liberated from occupation, was entrusted to "Tamiz Shahar" OJSC.

According to Decree No. 1735 of the President of the Republic of Azerbaijan dated July 2, 2022, in order to take further measures in the field of waste management and improve the municipal solid waste management, "Tamiz Shehar" OJSC has been assigned the responsibility of collecting, transporting, disposing and managing municipal solid waste in liberated areas until a new solid waste management mechanism is established in the Republic of Azerbaijan.

On 14 May 2026, President Ilham Aliyev signed a decree "On additional measures in the field of improving waste management." establishing the State Agency for Waste Management under the Ministry of Ecology and Natural Resources, that will be responsible for exercising the state control, regulation and coordination in the field of waste management (formation, collection, sorting, transportation, placement, processing, use, disposal, disposal and disposal of waste) and collection of fees for waste institution.

Here's some mitigation measures in a tabular format:

1. **"Tamiz Shahar" OJSC**

No.	Mitigation measure, detailed description and objective	Sector, Location, Implementer	Implementation period and Status	GHG emission source and Reduction volume	Results, Financial and Socio-economic Effects
1	Baku Municipal Solid Waste Incineration Plant (MSWIP) and Balakhani Municipal Solid Waste Sorting Plant	Economic sector: Waste management and Energy. Location: Baku city, Sabunchu district (Balakhani settlement). Responsible/Implementer: "Tamiz Shahar" OJSC / Operator: "Paprec Enerji Azerbaijan".	Status: Under implementation (continuously operating infrastructure). Period: Since 2012, indefinite/long-term operation.	Target gases: Methane (CH_4) and carbon dioxide (CO_2). Mechanism: Prevention of methane generation in landfills and replacement of conventional fuel-based electricity	Results: Since becoming operational, the plant has generated up to 200 million kWh of electricity annually and supplies it to the overall electricity grid

	Objective and description: Reduction of waste disposal to landfills, thermal treatment (energy recovery) and prevention of emissions arising from the extraction of primary raw materials through sorting. The annual incineration capacity of the MSWIP is 500,000 tonnes of municipal solid waste. The annual capacity of the sorting plant is 100,000 tonnes.			generation. Projected reduction: ~500,000–550,000 tCO_2e/year. Current actual reduction: ~500,000–550,000 tCO_2e/year.	of Baku city. Paper, glass, plastic, metal and other raw materials are separated at the sorting plant. Financial source: State budget / investment project. Socio-economic effects: 1. Renewable energy generation and natural gas savings. 2. Low-cost raw material market for recycling. 3. Reduction of negative impacts on the environment and atmosphere.
1.1	Emission Reduction Purchase Agreement between "Tamiz Shahar" OJSC and BB Energy (ASIA) PTE LTD Objective and description: Verification and validation of greenhouse gas (GHG) emission reductions from the Waste-to-Energy Plant and Balakhani	Location: Baku city. Responsible/Implementer: "Tamiz Shahar" OJSC / BB Energy (ASIA) PTE LTD.	Status: Under implementation (signed and effective agreement).	Target gases: CO_2, CH_4. Mechanism: GHG emission reductions verified in accordance with international standards.	Results: Confirmation that "Tamiz Shahar" OJSC's waste management infrastructure fully complies with international climate standards and verification of carbon credits/emission reductions.

	landfill in accordance with international climate standards / climate finance.				
2	Biogas Collection, Leachate Treatment Facility and Medical Waste Sterilization Station at Balakhani Sanitary Landfill Objective and description: Capture of biogas generated from the decomposition of organic waste at the 120-ha landfill and conversion into electricity using a 2 MW generator. Treatment of leachate by reverse osmosis to convert it into technical water. Since May 2025, medical waste has been neutralized at the Medical Waste Sterilization Station.	Economic sector: Waste management, Renewable energy and Environment. Location: Baku city, Balakhani settlement. Responsible/Implementer: "Tamiz Shahar" OJSC.	Status: Under implementation. Period: Since 2009, indefinite (Sterilization Station: since 2025).	Target gases: Methane (CH_4) and harmful toxic emissions. Mechanism: Prevention of direct leakage of landfill gas into the atmosphere.	Results: 2.9 million m² of the area has been covered with geomembrane and isolation layers, and 26 cells have been constructed. A 2 MW biogas generator is operating, and more than 14,000 trees have been planted. Medical waste is sterilized and safely buried. Financial source: World Bank ("Integrated Solid Waste Management" project) and the Company's own funds. Socio-economic effects: 1. Prevention of groundwater and soil pollution. 2. Reuse of treated wastewater for irrigation. 3. Ensuring sanitary and

					epidemiological safety.
3	Waste Management Infrastructure in the Karabakh and Eastern Zangazur Economic Regions Objective and description: Reception and disposal of waste in Aghdara, Khojaly, Khojavand, Zangilan, Gubadli, Aghdam, Lachin, Jabrayil, Fuzuli and Kalbajar; construction of the Aghdam and Jabrayil landfills and Fuzuli and Zangilan transfer stations during 2026–2027.	Economic sector: Waste management and regional reconstruction. Location: Karabakh and Eastern Zangazur economic regions. Responsible/Implementer: "Tamiz Shahar" OJSC.	Status: Under implementation and in the planned construction/design stage. Period: 2021–2030.	Target gases: Methane (CH_4) and carbon dioxide (CO_2). Mechanism: Elimination of illegal waste disposal sites and savings in fuel and emissions through optimized logistics (GPS) and sorting. Current actual reduction: Mitigation effect increasing gradually.	Results: Procurement processes are being conducted for the construction of landfills/transfer stations in Aghdam, Jabrayil, Fuzuli and Zangilan. Financial source: State budget. Socio-economic effects: 1. Environmental restoration of the regions and contribution to the "Green Zone" concept. 2. Public awareness and promotion of a new waste culture. 3. Reduction of logistics costs and emissions.
4	Establishment of Balakhani Industrial Park and Development of Recycling Industry Objective and description: Development of recycling in the country, incorporation of waste into recycling	Economic sector: Waste recycling, Industry and Green Economy. Location: Baku city, Sabunchu district, Balakhani settlement (28.565 ha). Responsible/Implementer: "Tamiz Shahar" OJSC / residents of the Industrial Park.	Status: Under implementation (operational and expanding infrastructure). Period: Since 2011, indefinite (official opening: 2017).	Target gases: Carbon dioxide (CO_2) and methane (CH_4). Mechanism: Reduction of energy consumption and GHG emissions arising from the extraction/processing of primary raw materials through waste recycling, and prevention of waste disposal in landfills.	Results: 28 residents (29 areas of activity) are currently registered in the Park's 28.565-ha territory. Twenty-one of the residents have already commenced active operations, while the others continue

	processes as raw material, and support for the "green economy". The industrial park was established by Order No. 1947 of the President of the Republic of Azerbaijan dated 28 December 2011 and officially opened on 22 September 2017. Its proximity to the Balakhani landfill and the MSWIP provides optimal raw material and energy supply.			Current actual reduction: Indirect GHG reduction through replacement of primary raw materials in proportion to recycling volumes.	installing their production facilities. Financial source: State support (infrastructure) and private investment (residents). Socio-economic effects: 1. Development of the recycling industry and resource savings. 2. Attraction of private investment into the non-oil sector and creation of new jobs. 3. Easier access of finished products to sales markets and optimization of transport logistics.
5	Waste Management Infrastructure in Gala Settlement, Khazar District Objective and description: Construction of a Municipal Solid Waste Sorting Plant with an annual capacity of 100,000 tonnes and a transfer	Economic sector: Waste management and sorting. Location: Baku city, Khazar district (Gala settlement). Responsible/Implementer: "Tamiz Shahar" OJSC.	Status: Planned construction / design stage. Period: 2027–2029 (for construction of the Gala sorting plant).	Target gases: Methane (CH_4) and carbon dioxide (CO_2). Mechanism: Fuel savings through optimized logistics (GPS) and emission reductions through sorting and directing waste to recycling. Current actual reduction: Increasing mitigation effect following the design	Results: Technical-Economic Justification (TEJ) and Environmental and Social Impact Assessment (ESIA) documents are currently being prepared for the 100,000-tonne sorting plant in Gala settlement.

	station in Gala settlement during 2027–2029.			and construction stages.	Financial source: World Bank. Socio-economic effects: 1. Source separation of waste and obtaining secondary raw materials. 2. Public awareness and improvement of household waste culture.

2.Nakhchivan Autonomous Republic, Republic of Azerbaijan

1	Name of the mitigation measure, detailed description, purpose, responsible organization, executing agency, coordination issues, all stages of the measure, etc.	Action Name: Improvement of solid waste management, waste sorting, and recycling redirection. Description and Objectives: Improvement of waste management: systematic collection, transportation, sorting, and recycling of solid municipal waste in the Nakhchivan Autonomous Republic. The goal is to prevent uncontrolled dumping/burning, reduce landfill waste volumes, and lower methane (CH4) and carbon dioxide (CO2) emissions. The main objects of the event are to prevent uncontrolled dumping and burning of waste, reduce the volume of waste placed in landfills, and thereby contribute to the reduction of methane (CH_4) and carbon dioxide (CO_2) emissions. Responsible organization: Ministry of Ecology and Natural Resources of the Nakhchivan Autonomous Republic of Azerbaijan Executive bodies: Local executive authorities, municipalities and investors responsible for waste collection, transportation, sorting, placement and management Coordination issues: The implementation of the event is ensured on the basis of mutual coordination between relevant state bodies, local executive authorities, municipalities and other interested parties. Information is exchanged on ecological monitoring, waste accounting, the volume of waste directed for recycling and environmental impact assessment.

		Main Stages: • Assessment of current municipal waste generation, collection, transport, and disposal; • Ecological evaluation of waste infrastructure and landfills; • Phased expansion of separate waste collection and sorting; • Diverting paper, cardboard, plastic, metal, and glass to recycling streams; • Reducing biodegradable organic waste sent to landfills; • Preventing illegal dumping and open burning; • Building and modernizing waste management infrastructure; • Monitoring GHG emissions (CH4) and evaluating future CO2e reductions; • Public awareness campaigns on waste reduction, sorting and recycling. As a result of the implementation of the event, it is expected to increase the efficiency of waste management, reduce the volume of waste entering landfills, expand recycling potential, minimize the risks of soil and atmospheric air pollution, and at the same time contribute to the reduction of GHG emissions from the waste sector.
2	Scope of the mitigation measure, economic sectors involved, and region(s) of the Republic of Azerbaijan where it is implemented:	In order to improve the solid waste management in the autonomous republic, the relevant a landfill will be established in the suburb of Nakhchivan city
3	Status of the mitigation measure (implemented, in progress, officially adopted but not yet started, in the planning stage without being officially adopted)	Currently, measures are being taken to cover the surface of waste with a layer of soil in landfills operating in the autonomous republic, as well as to gradually recultivate and green the areas. The work carried out serves to reduce the negative impact of landfills on the environment, prevent pollution, restore soil cover and improve the ecological condition of the areas. In addition, the creation of a new landfill that meets modern ecological and sanitary requirements is in the planning and preparation stage. For this purpose, opinions from relevant agencies have been received on changing the land category of the intended area, and relevant documents for filing a petition based on the collected opinions have been submitted to the Cabinet of Ministers of the Nakhchivan Autonomous Republic
4	Implementation timeline	2023-2027
5	Targeted Greenhouse Gas (GHG) Emission Sources or Abatement	It aims to reduce methane (CH_4) emissions from the decomposition of municipal solid waste in landfills, as well as carbon dioxide (CO_2) emissions from the transportation,

	Types, and Expected Volume of Emission Reductions (tCO_2eq)	processing and incineration of waste. It is expected to reduce GHG emissions as a result of waste sorting, recycling and reducing the placement of organic waste in landfills.
6	Current Implementation Stage, Initial Results & Funding Source	Currently, the mitigation measure is in the planning and preparation stage. Preliminary preparatory work has been carried out on the project, opinions of relevant agencies have been received regarding the planned area, and relevant documents have been submitted to the Cabinet of Ministers of the autonomous republic for approval of the relevant land category change for a centralized waste landfill. Improving solid waste management, establishing a centralized waste landfill and processing plant are among the measures envisaged in the relevant State Program. It is planned to provide financing for the project through funds allocated within the state budget and state investment programs, as well as attracting local and foreign investors.
7	Current GHG Reduction / Removal Achievements Type of GHG emissions and amount of reduction (tCO_2eq)	As the mitigation measure is currently in the planning and preparation stage, no actual GHG emission reductions have been recorded. Therefore, the amount of reduction in CO_2 equivalent of CH_4 and CO_2 emissions has not been determined at this stage. Calculation of emission reductions will be possible once the measure is implemented and relevant monitoring data is available.
8	Socio-Economic & Environmental impacts	As the project is currently in the planning stage, direct socio-economic effects have not been fully formed. As a result of the project implementation, it is expected to create new jobs, expand economic activity in the field of waste sorting and recycling, improve the sanitary and environmental condition of settlements, and reduce the risks of negative impacts on public health and environmental pollution.

3. Reduction of GHG Emissions through Waste Reduction and Energy Use Management by the Azerbaijan Space Agency (Azercosmos)

1	Name of the mitigation measure, detailed description, objective, responsible organization, implementing organization, coordination arrangements, all stages of the measure, etc.	Mitigation Measure: Reduction of GHG Emissions through Waste Reduction and Energy Use Management Description: Management of waste in the "5R" hierarchy (Reduce → Reuse → Recycle → Recover → **Remove**); accordance with monitoring of energy

		consumption in operational processes and tracking of CO_2-equivalent emissions. Objective: To reduce methane (CH_4) emissions generated from the decomposition of waste and carbon dioxide (CO_2) emissions resulting from energy consumption. Responsible Organization: The Azerbaijan Space Agency (Azercosmos). Implementing Entities: Land Managers and the HSE Representative, in coordination with licensed contractors. Key Stages: Waste segregation and safe transfer → collection of energy consumption data → calculation and monitoring of CO_2-equivalent emissions → annual assessment of results as part of the Management Review.
2	**Characteristics of the mitigation measure, the economic sector(s) to which it applies, and the region(s) of the Republic of Azerbaijan where it is implemented**	It relates to the areas of waste management and energy efficiency. The measure will be implemented across all Azercosmos facilities and project sites within the territory of the Republic of Azerbaijan, including ground-based space infrastructure and administrative/production buildings.
3	**Status of the mitigation measure** (implemented, currently being implemented, officially adopted for implementation but not yet commenced, or at the planning stage without having been officially adopted for implementation)	It is currently at the planning stage and has not yet been formally approved for implementation.
4	**Period for which the mitigation measure is planned** (specifying the start and end years of implementation, as	Implementation is planned to commence following the approval of the plans

	well as the exact timeframe for each stage, where applicable)	(approximately by the end of 2026/2027). The measure is intended to be continuous and repeated on an annual basis, with no specified end date.
5	What type of greenhouse gas (GHG) emission sources is the mitigation measure aimed at, or which gases does the absorption relate to? At the end of the mitigation measure, which gases and in what quantity will be reduced (expressed in total CO_2 equivalent)? The GHGs include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and other indirect greenhouse gas emissions (SO_2, NO_x, CO), etc.	The main greenhouse gases covered are methane (CH_4), generated primarily from the decomposition of organic waste in landfills, and carbon dioxide (CO_2), resulting from energy consumption. The exact volume of emissions reduction (CO_2e) will be calculated once the implementation of the measure is launched.
6	**What stages of the mitigation measure have been implemented to date, what preliminary results have been achieved, and what sources of financing have been used (e.g., government support, donor-funded projects, etc.)?**	Currently, only planning documents are being prepared; implementation has not yet commenced, and no initial results are available. Source of Financing: Azercosmos's own budgetary funds.
7	**Under the current status of the mitigation measure, what types of GHG emissions have been reduced and by what amount (in CO_2 equivalent)?**	As the measure has not yet started, the measurable data on GHG emissions reductions are not available at this stage.
8	**What other socio-economic impacts have resulted from the mitigation measure to date?**	Expected Effects: Optimization of waste management and energy costs, support for the local recycling industry, and increased environmental awareness among employees. At the current stage, no measurable results have yet been recorded.

8.SUMMARY OF FLEXIBILITIES IN NDC TRACKING

Azerbaijan applies flexibility under Paragraph 85 due to limited capacity for estimating GHG emission reductions in a detailed tabular format. The country provides qualitative descriptions of policies and measures but lacks the technical resources for precise quantitative estimates at this time.	Capacity constraints include insufficient data, technical expertise, and modeling tools needed to produce accurate estimates of expected and achieved emission reductions.	Azerbaijan aims to improve its ability to provide detailed emission reduction estimates for BTR 3. This will involve developing technical expertise, enhancing data collection systems, and implementing necessary modeling tools for more accurate reporting.
Azerbaijan applies flexibility under Paragraph 92 by not including the projections, due to current limitations in its capacity to fully comply with detailed projection reporting requirements.	Capacity constraints include insufficient technical expertise and limited data availability needed to provide comprehensive and accurate projections as outlined in the MPGs.	Azerbaijan plans to improve its capacity to provide detailed projections for BTR 3, through enhancing technical capacities to use modeling tools, improving data systems, and technical training to align with the full reporting guidelines.

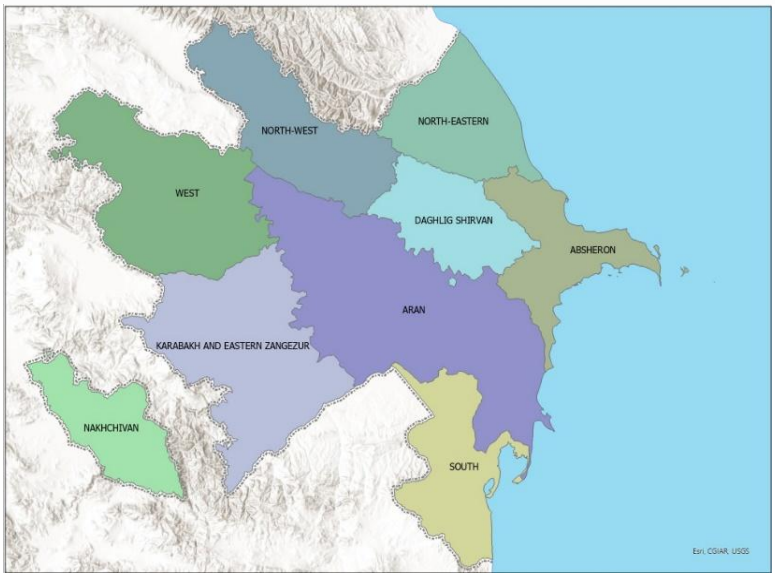
Chapter III. Climate Change Impacts and Adaptation under Article 7 of the Paris Agreement

IMPACTS, RISKS AND VULNERABILITIES

CURRENT AND PROJECTED CLIMATE TRENDS AND HAZARDS

In recent years, as across the world, the intensity and geographical coverage of hazardous hydrometeorological events have increased in the country territory. In order to assess the impacts and consequences of climate change in Azerbaijan, analyses were conducted based on statistical data from the National Hydrometeorological Service under the Ministry of Ecology and Natural Resources, the State Water Resources Agency of Azerbaijan, the Ministry of Emergency Situations, as well as the climate report and expert opinion of the Space Agency of the Republic of Azerbaijan (Azercosmos).

Temperature and precipitation anomalies were calculated for 9 regions characterized by distinct climate features. The analyzed regions are as follows:



- Absheron region;
- Nakhchivan Autonomous Republic;
- Aran region;
- North-Eastern region;
- Mountainous Shirvan region;
- North-Western region;
- Western region;
- Karabakh and Eastern Zangezur;
- Southern region;

The analysis of the Garabagh and Eastern Zangazur region was conducted based on data from automatic hydrometeorological stations restored and newly installed under the "I State Program on the Great Return to the liberated territories of the Republic of Azerbaijan", as well as time series reconstructed using mathematical and statistical methods.

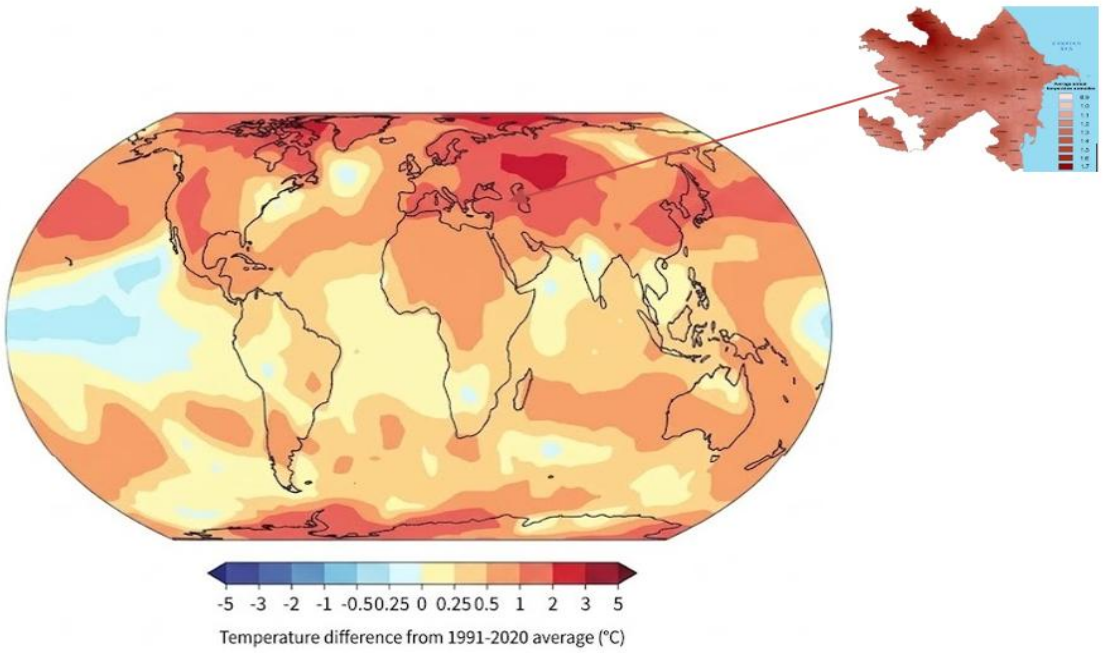
Automatic hydrometeorological stations restored and newly installed in the Garabagh and Eastern Zangazur region under the "I State Program on the Great Return to the liberated territories of the Republic of Azerbaijan":

№	Observation Station Name	Location
	11 sets of automatic hydrological stations in 2021	
1	Tartarchay-Kalbajar	Kalbajar district
2	Tutgunchay-Jomard	Kalbajar district, Jomard village
3	Tartarchay-Vang	Kalbajar district, Vang village
4	Guruchay-Boyuk Taghlar	Khojavend district, Boyuk Taghlar village
5	Kondalanchay-Gırmızı Bazar	Khojavend district, Gırmızı Bazar village
6	Zabukhchay-Bozlu	Lachin district, Bozlu village
7	Hakarichay-Balasoltanli	Gubadli district, Balasoltanli village
8	Bargushadchay-Aliguluushaghi	Gubadli district, Aliguluushaghi village
9	Okhchuchay-Burunlu	Zangilan district, Burunlu village
10	Basitchay-Razdara	Zangilan district, Razdara village
11	Araz-Agband	Zangilan district, Agband village
	5 sets of automatic meteorological stations in 2022	
1	Shusha	Shusha city
2	Aghdam	Aghdam city
3	Fuzuli	Fuzuli city
4	Kalbajar	Kalbajar district, Zar village
5	Zangilan	Zangilan district, Agband village
	2 sets of automatic meteorological stations in 2025	
1	Tartar	Tartar district
2	Lachin	Lachin district

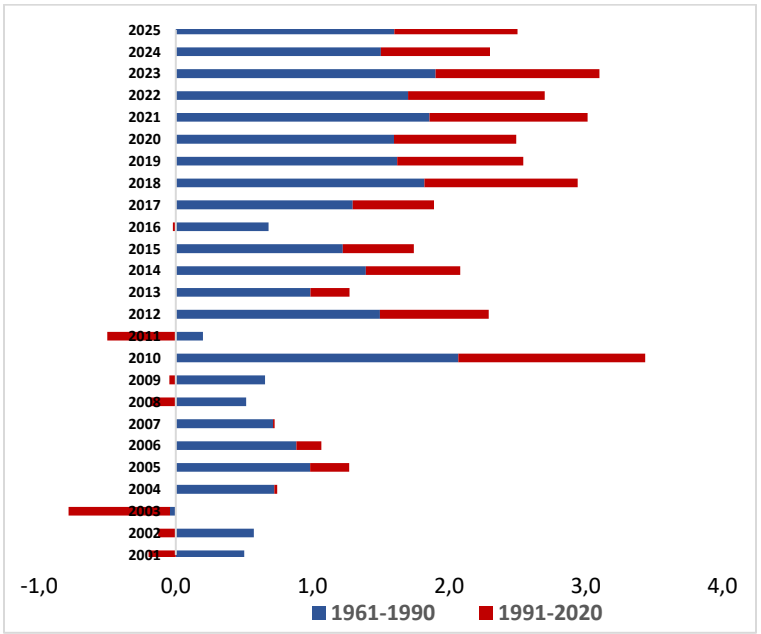
Temperature and precipitation changes

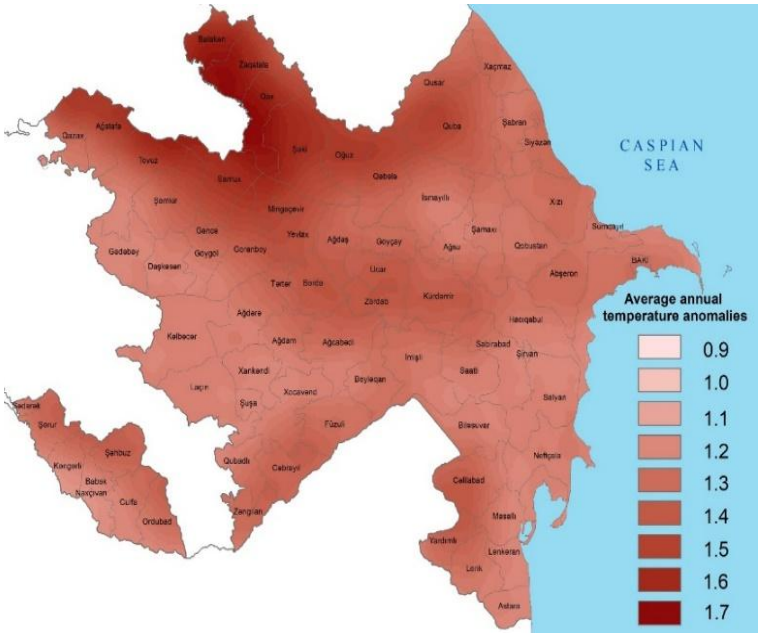
In recent years, the need arose to update multi-year climate normals for the purpose of assessing climate change impacts. In this regard, upon the recommendation of the World Meteorological Organization, new climate normals covering 1991–2020 were prepared. Thus, temperature and precipitation normals covering 1991–2020 for 51 meteorological stations nationwide were calculated and updated. The analyses presented in the report were conducted comparatively against the new normals and the baseline period (1961-1990).

An increase in temperature is observed in all regions of the country over recent decades. Temperature rise varies depending on areas and seasons. Namely, the number of days below 0°C across the country has decreased. This process is particularly noticeable in mountainous areas during winter months.



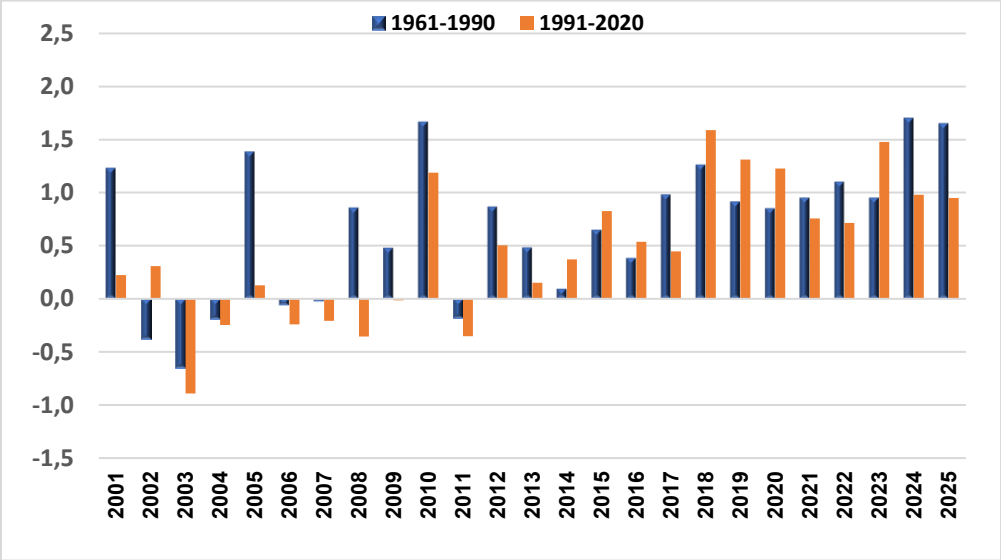
Annual average temperature anomalies for 2025 relative to the 1991-2020 average –WMO-State of the Global Climate 2025 (***https://library.wmo.int/viewer/69807/?offset=#page=24&viewer=picture&o=bookmark&n=0&q=***)





Average annual temperature across the country for the years 2001–2025

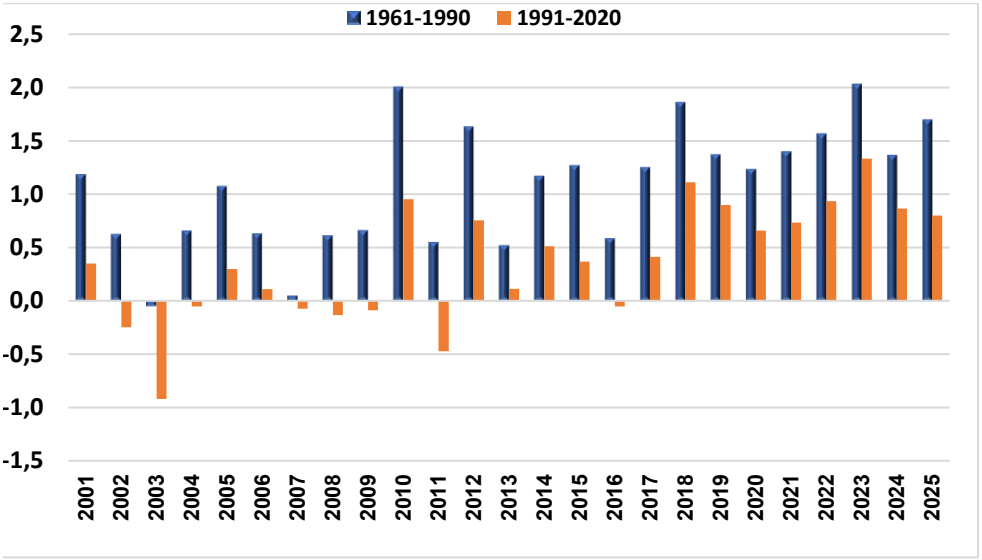
Temperature anomalies by region over the last 25 years:



In Baku city and Absheron peninsula: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.5°C
1961-1990	+0.7°C

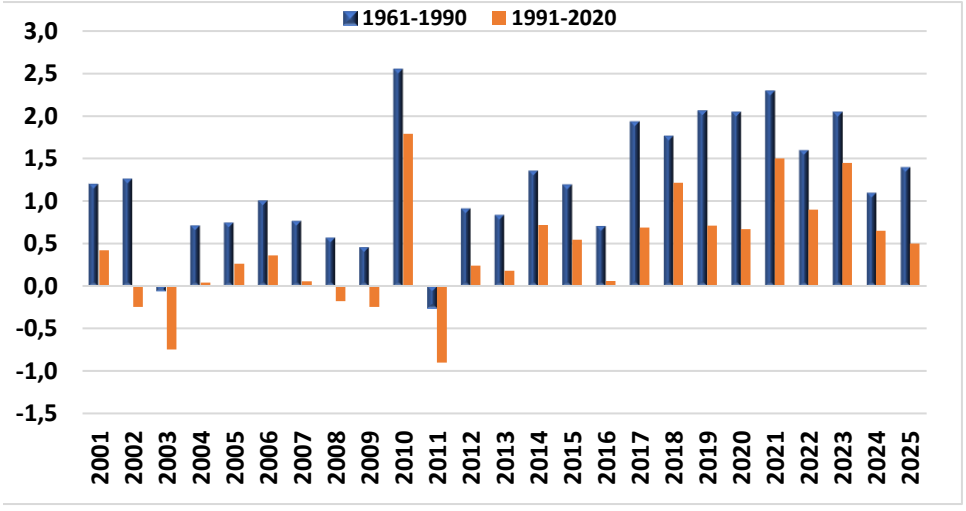
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.3°C.



In Aran region: Mean annual temperature anomaly: 1991-2020: +0.4°C; 1961-1990: +1.1°C:

Period	Difference
1991-2020	+0.4°C
1961-1990	+1.1°C

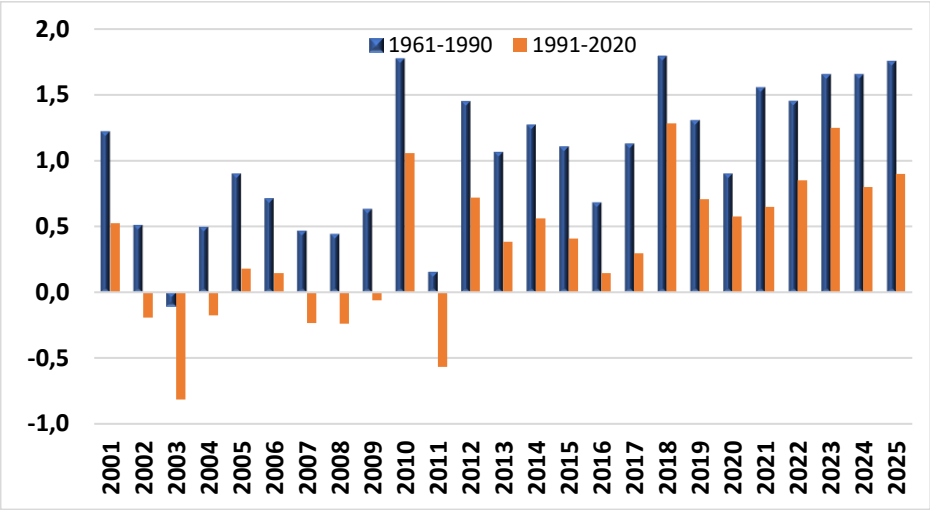
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.6°C.



In North-East region: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.4°C
1961-1990	+1.2°C

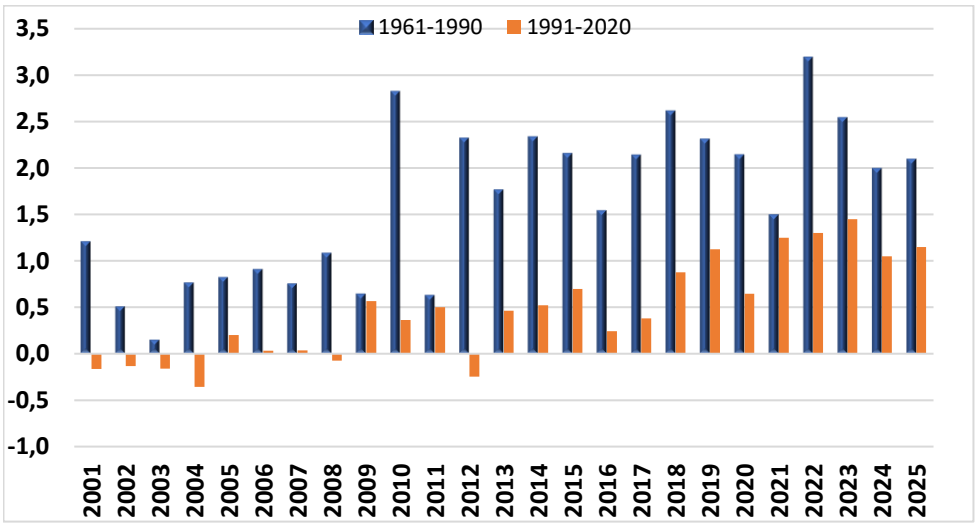
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.0°C.



In South region: Mean annual temperature anomaly: 1991-2020: +0.4°C; 1961-1990: +1.0°C:

Period	Difference
1991-2020	+0.4°C
1961-1990	+1.0°C

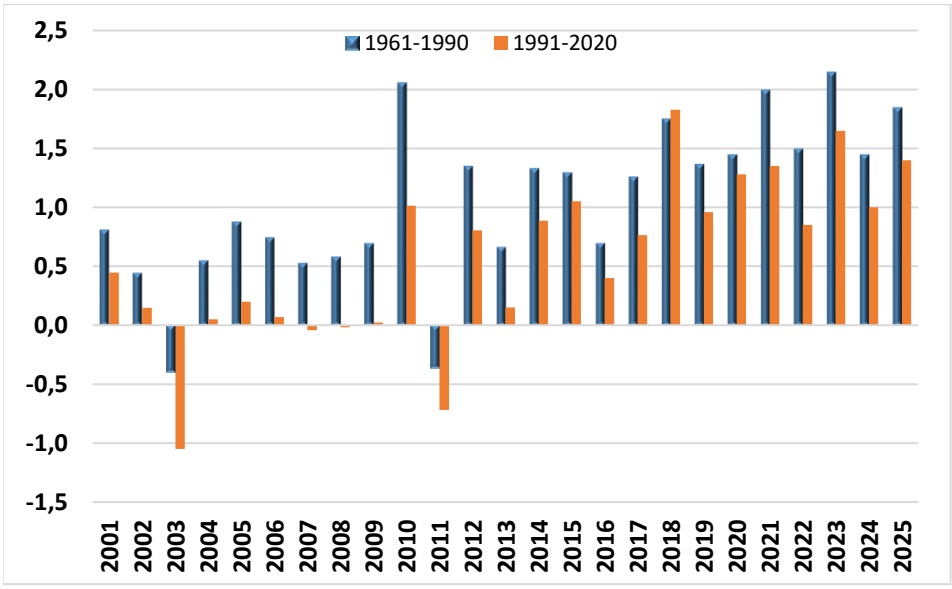
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +0.9°C.



In North-West region: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.5°C
1961-1990	+1.6°C

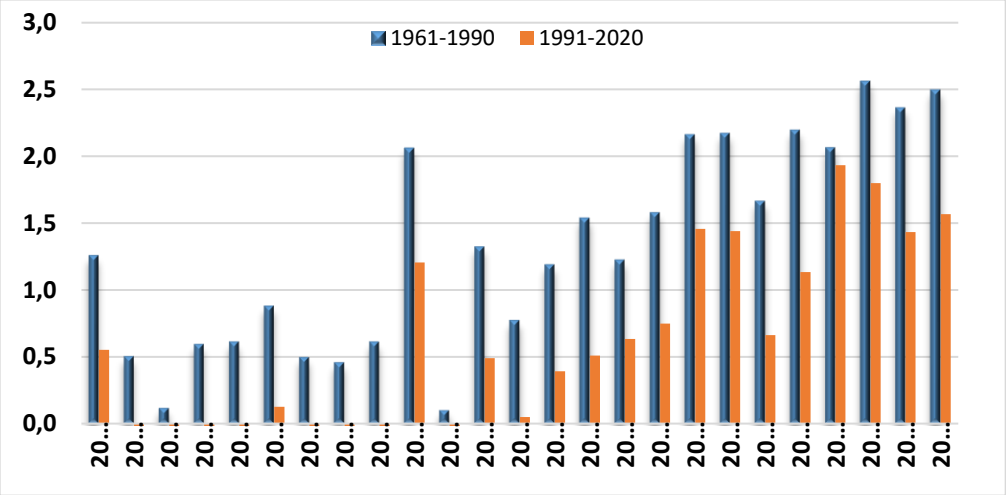
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.2°C.



In Mountainous Shirvan region: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.6°C
1961-1990	+1.1°C

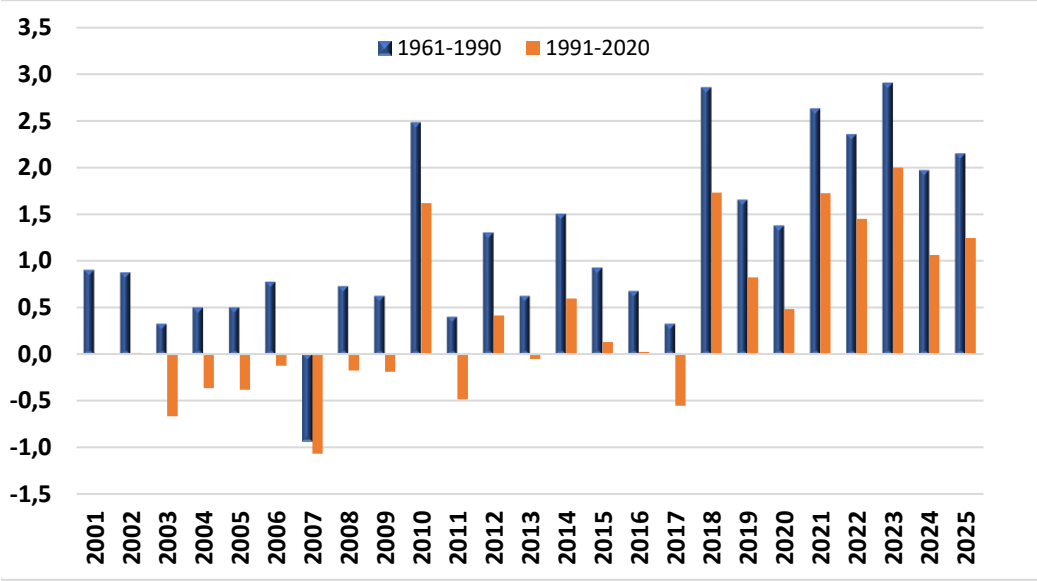
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.3°C.
.



In West region: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.5°C
1961-1990	+1.3°C

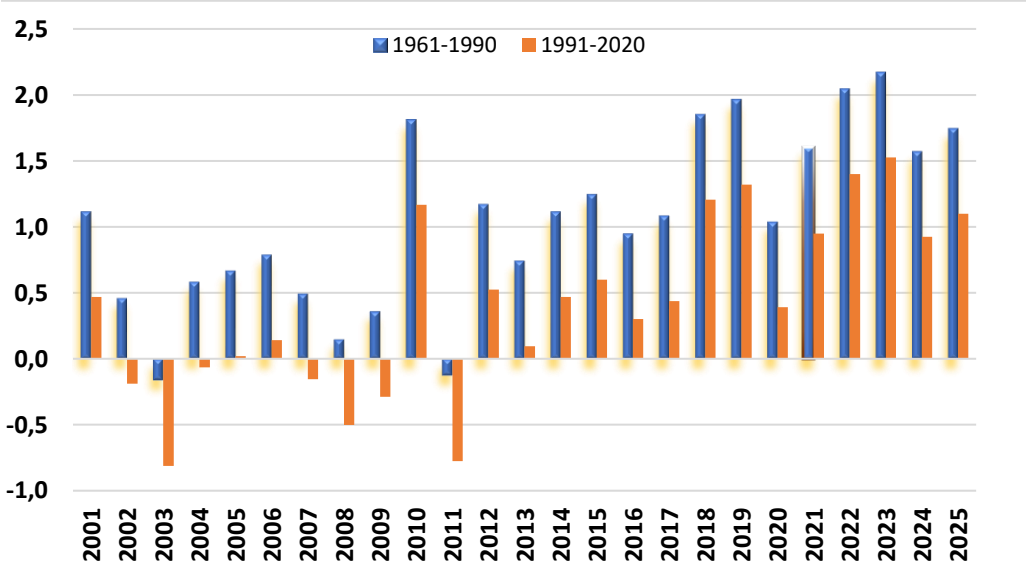
In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.6°C.



In Nakhchivan region: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.4°C
1961-1990	+1.2°C

In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.5°C.



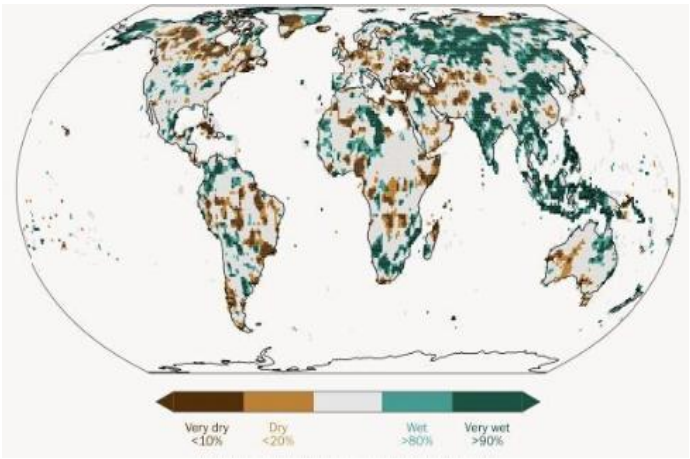
In Eastern Zangazur and Garabagh region: Mean annual temperature anomaly:

Period	Difference
1991-2020	+0.4°C
1961-1990	+1.1°C

In the last 5 years, the average temperature anomaly compared to 1991-2020 indicators was +1.2°C.

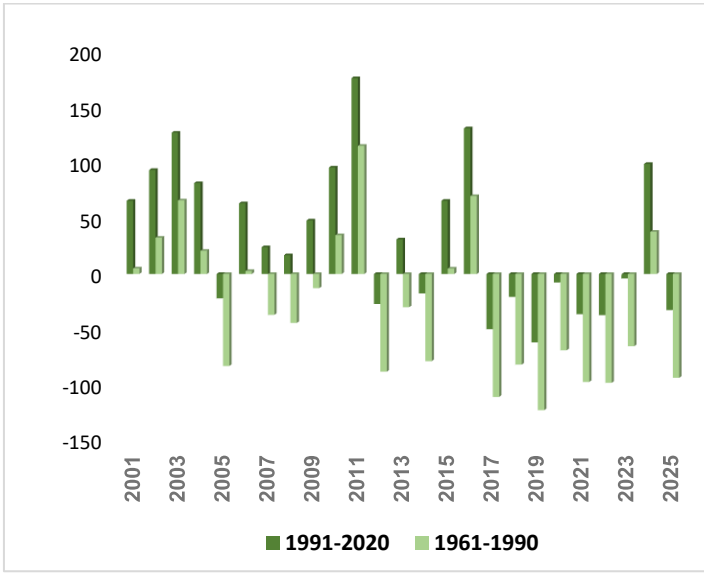
Precipitation over the last 25 years

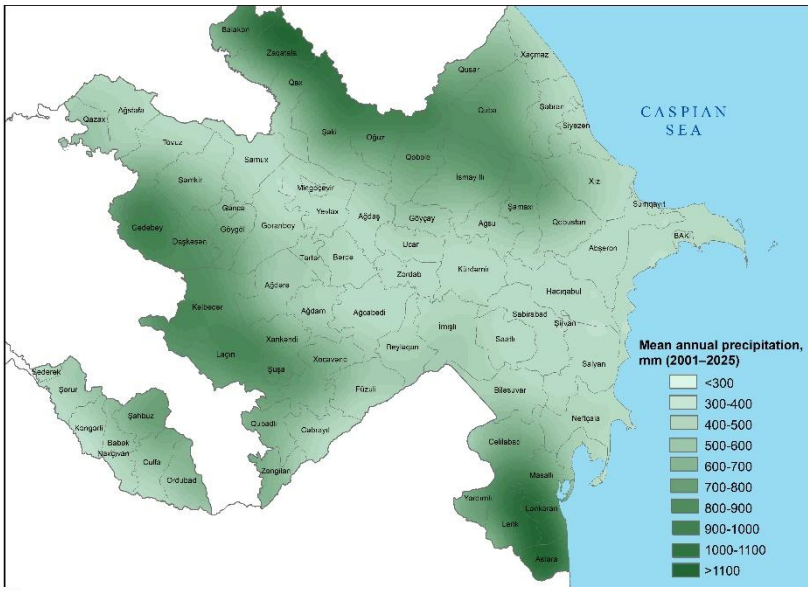
An increase in extreme precipitation events is observed in recent decades. The temporal and spatial distribution of precipitation is also characterized by sharp contrasts. Namely, while drought events are observed in one part of the country, heavy rains can result in floods in other parts. Such uneven precipitation distribution creates additional risks for agriculture, water resource management, and ensuring resilience in other sectors.



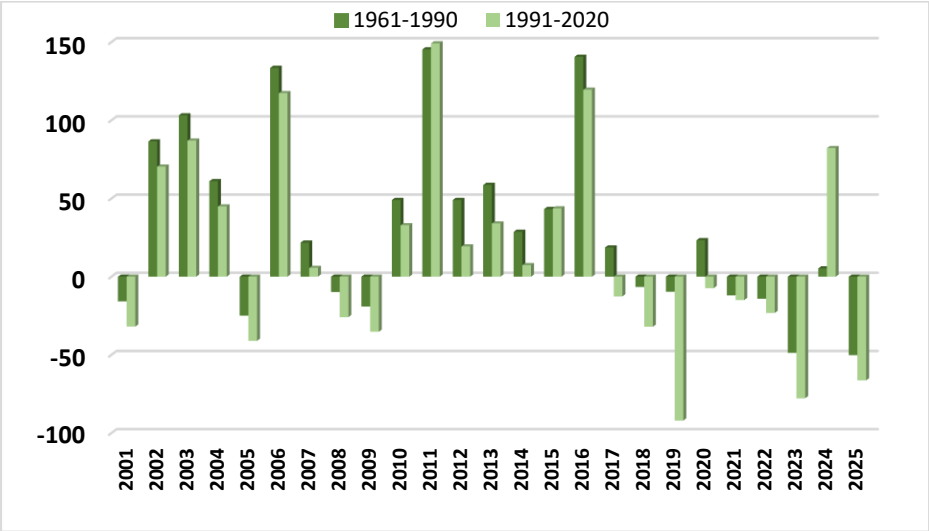
Annual precipitation in 2025 expressed as percentiles of the 1991–2020 distribution –WMO-State of the Global Climate 2025
https://library.wmo.int/viewer/69807/?offset=#page=25&viewer=picture&o=bookmark&n=0&q=



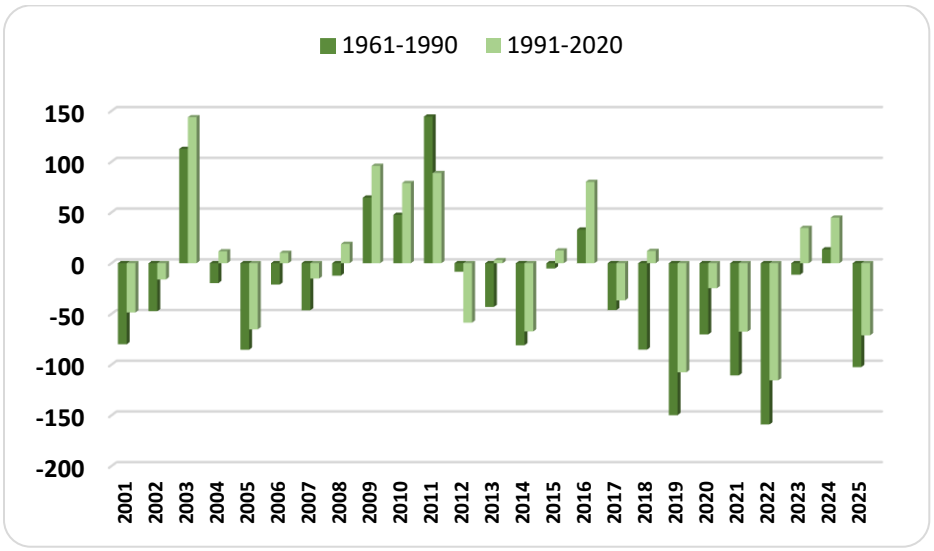




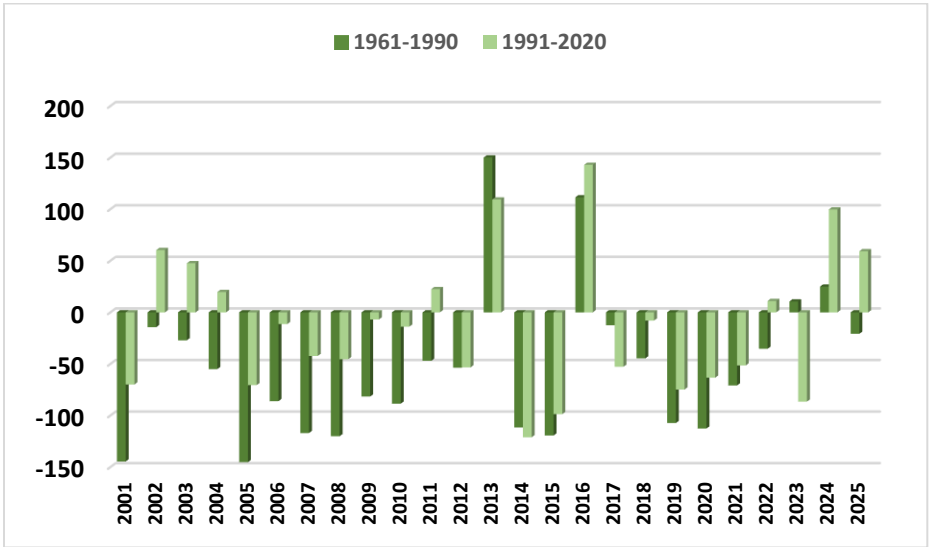
Precipitation anomaly for the years 2001–2025



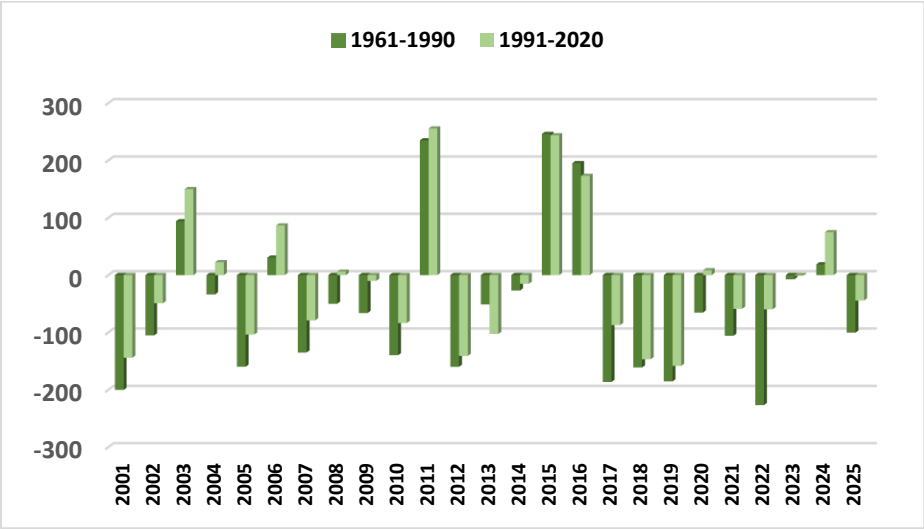
In Baku city and Absheron peninsula: average precipitation increased by 14 mm over the last 25 years, and by 30 mm compared to baseline. In the last 5 years, average precipitation anomaly decreased by 20 mm compared to 1991-2020.



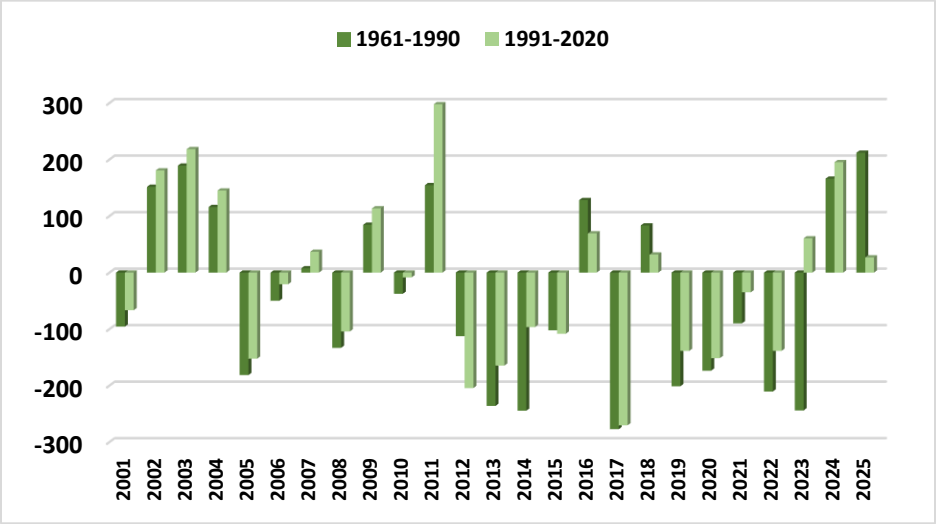
In Aran region: average precipitation decreased by 31 mm over the last 25 years. In the last 5 years, average precipitation anomaly decreased by 35 mm compared to 1991-2020.



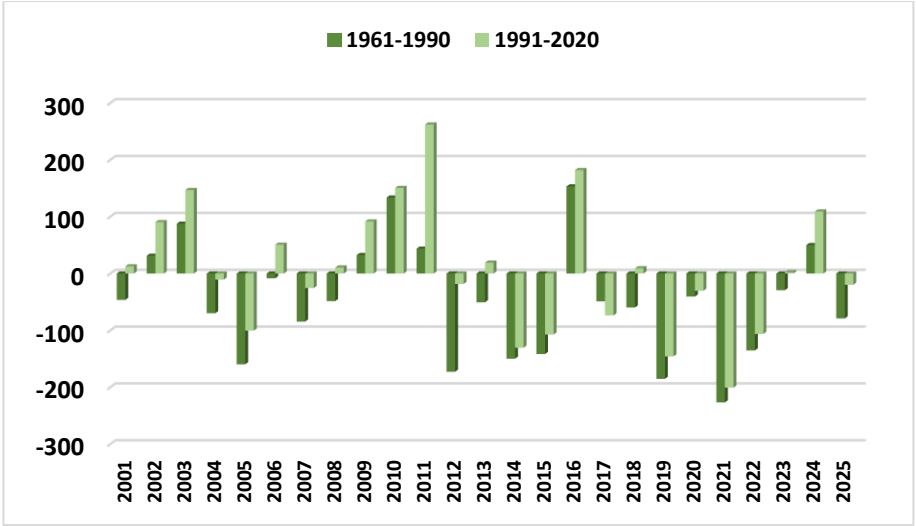
In North-East region: average precipitation decreased by 12 mm over the last 25 years, and by 53 mm compared to baseline. In the last 5 years, average precipitation anomaly showed an increase of 6.0 mm compared to 1991-2020.



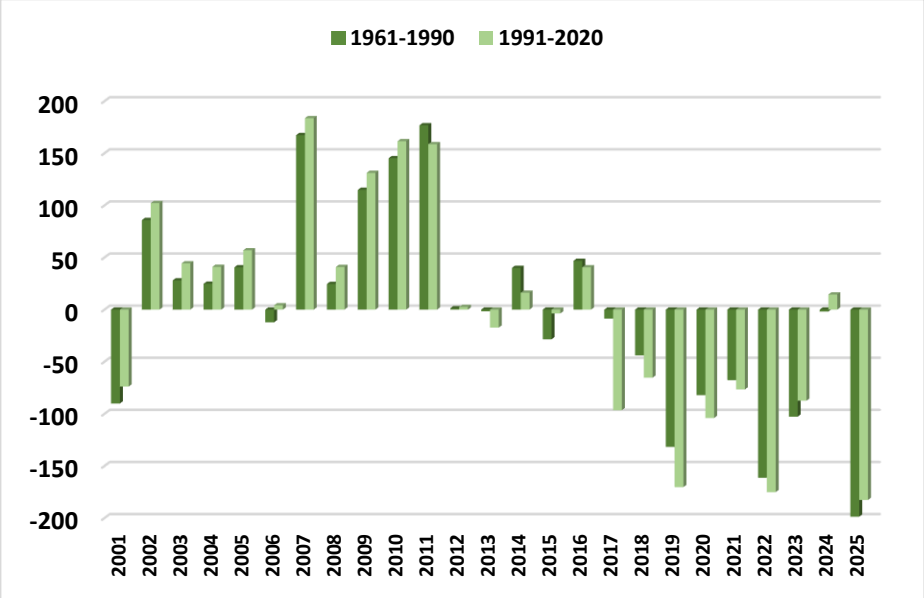
In South region: average precipitation decreased by 54 mm over the last 25 years, and by 77 mm compared to baseline. In the last 5 years, average precipitation anomaly decreased by 84 mm compared to 1991-2020.



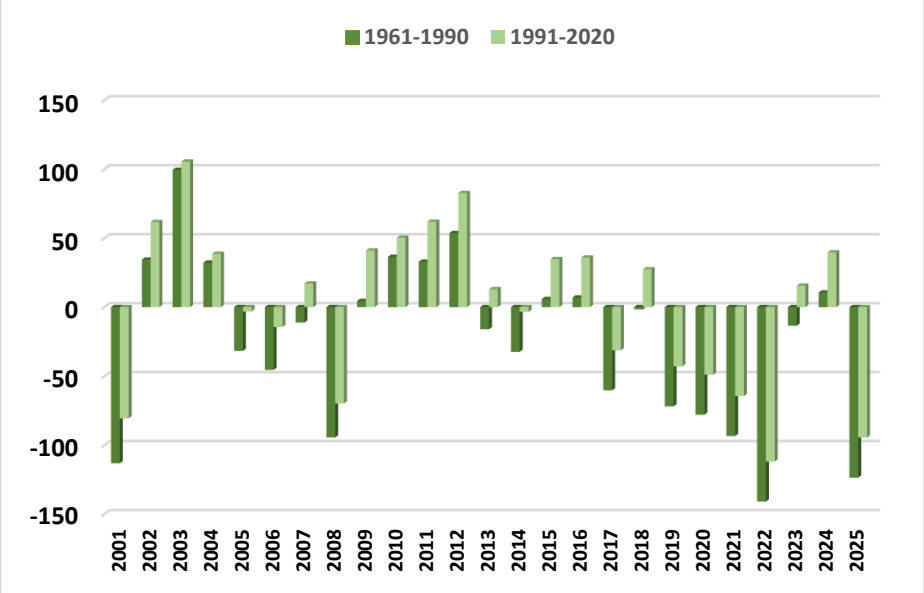
In North-West region: average precipitation decreased by 11 mm over the last 25 years, and by 44 mm compared to baseline. In the last 5 years, average precipitation anomaly increased by 22 mm compared to 1991-2020.



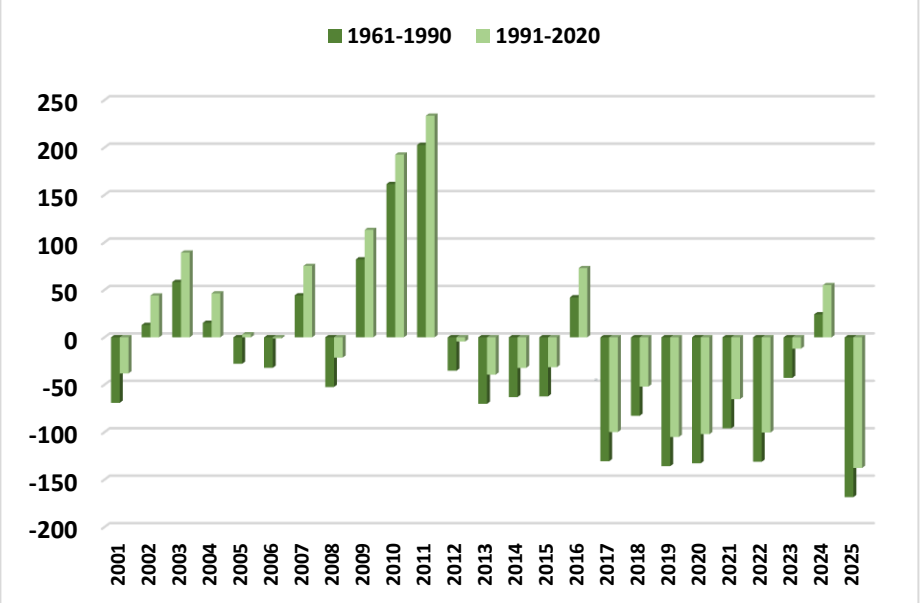
In Mountainous Shirvan region: average precipitation increased by 7.0 mm over the last 25 years, but a decrease of 48 mm was recorded compared to baseline. In the last 5 years, average precipitation anomaly decreased by 43 mm compared to 1991-2020.



In West region: average precipitation decreased by 2.0 mm over the last 25 years, and by 2.0 mm compared to baseline. In the last 5 years, average precipitation anomaly decreased by 101 mm compared to 1991-2020.



In Nakhchivan AR: precipitation increased by 2.4 mm over the last 25 years, but a decrease of 27.0 mm was recorded compared to baseline. In the last 5 years, average precipitation anomaly decreased by 43 mm compared to 1991-2020.

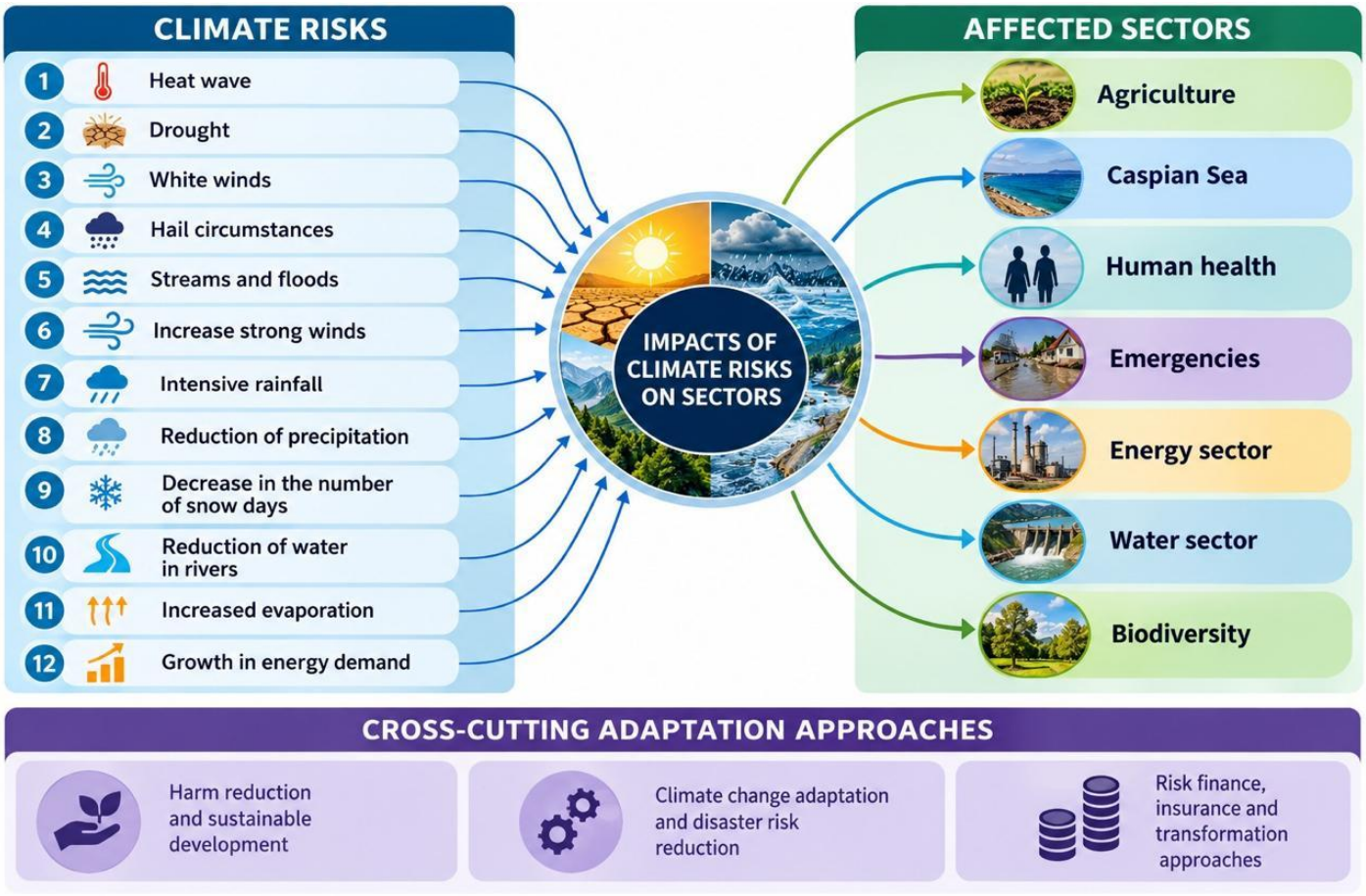


In Eastern Zangazur and Garabagh region: precipitation increased by 3.0 mm over the last 25 years, but a decrease of 27.0 mm was recorded compared to baseline. In the last 5 years, average precipitation anomaly decreased by 52 mm compared to 1991-2020.

2. CLİMATE CHANGE RİSK MAPPİNG

Azerbaijan is truly unique. The geographical location and diverse relief allow us to consider a relatively small territory as a model for 8 climate types. Environmental problems that comes by climate change, characteristic for steppe and semi-desert, coastal and mountainous countries, are also observed in our country. Here are just some of them: land erosion, melting glaciers, degradation of wetland areas, changes in sea level, forest fires, and a decrease in water resources.



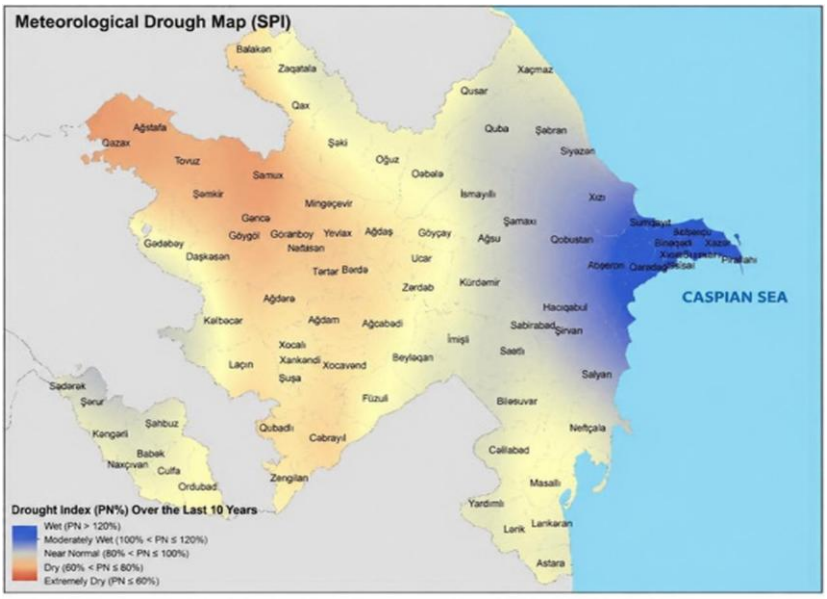


Drought

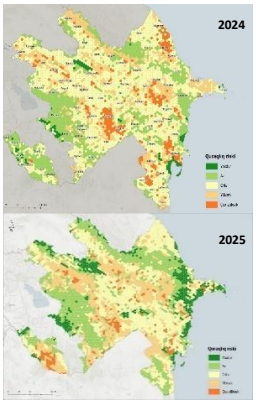
Drought poses a significant threat to ecosystems, agriculture, water resources, energy supply, and overall livelihoods. Such impacts can be exacerbated by increased rates of desertification and land degradation resulting from drought. Starting from 2022, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) method has been employed to assess drought risk. UN-SPIDER aims at improving actions to reduce disaster risk or support disaster response operations through remote sensing. This method comprises three stages:

- quantitative risk assessment;
- sensitivity assessment;
- determining the degree of drought risk impact.

In the 2025 assessment, it was found that the level of drought risk is high in 29% of the country's territory.



Within the framework of executing the measure "Expansion of drought mitigation measures" provided for in the Action Plan (2024–2027) of the "National Strategy on Efficient Use of Water Resources" approved by Decree No. 320 of the President of the Republic of Azerbaijan dated October 10, 2024, a meteorological drought map was prepared. The map reflects the spatial distribution and intensity of meteorological drought across the country over the last 10 years.



To assess drought levels nationwide, monitoring was conducted using multi-year optical satellite imagery. Vegetation changes across the country were evaluated over a 25-year period based on satellite imagery. Based on the assessment of drought levels using multi-year optical satellite imagery, severe dry regions were predominantly noted in Nakhchivan Autonomous Republic and Central Aran in 2025 **(**https://climatereport.az/az/section/draught-risk-assessment **)**

2.1 Melting of glaciers

In Azerbaijan, mountain glaciers are found in the Gusarchay basin on the northeastern slope of the Greater Caucasus. Since 2003, the National Hydrometeorology Department under the Ministry of Ecology and Natural Resources has undertaken studies to further analyze the glaciers in the Gusarchay basin.

Hydrometeorological data received from stations located in the Greater Caucasus region—specifically the Kabash hydrometeorological station (at an elevation of 3,510 m above sea level), as well as stations at Shahdag (2,712 m), Khinalig (2,301 m), Griz (2,006 m), Saribash (1,680 m), and Alibey (1,540 m)—are regularly collected and analyzed.

A mountain tundra climate prevails in the high-altitude zone (3,500-4,400 m) of the Main Caucasus and Side Range, where glaciers are located. This climate is characterized by high humidity, cold summers, and harsh winters. Until recent times, no continuous hydrometeorological observations had been conducted in the glacial zone.

The average annual temperature in this zone is consistently negative, ranging from -4°C to -5°C. In July, the average temperature remains below 5°C, while in January, it drops below -10°C. Annual precipitation ranges from 600 to 800 mm, with an average wind speed of 2-4 m/s. The average snow depth is 120-140 cm. The first recorded information about these

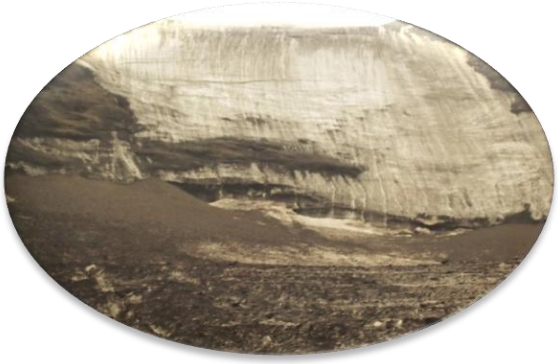
glaciers, including their area dates back to 1890. 8 glaciers with a total area of 4.9 km² were identified.

In the mid-1960s, the existence of these glaciers was confirmed through an expedition conducted by the Institute of Geography of the Azerbaijan National Academy of Sciences and the analysis of updated maps. 8 glaciers were observed in the Gusarchay basin, specifically in the Yatigdara River basin, the Abildara River basin (Tufandagh glacier), and the Duzyurd River basin (Shahdagh glacier). The total area of these glaciers was 3.2 km².

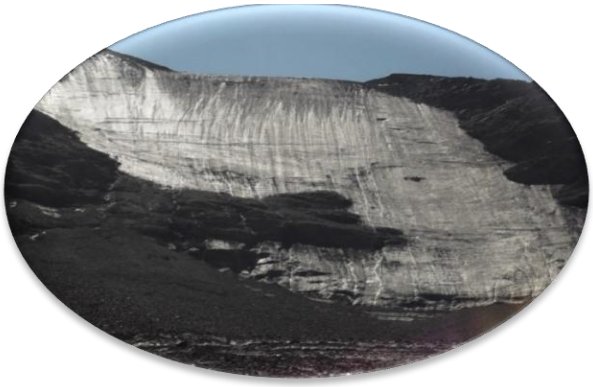
2013



2014



2015



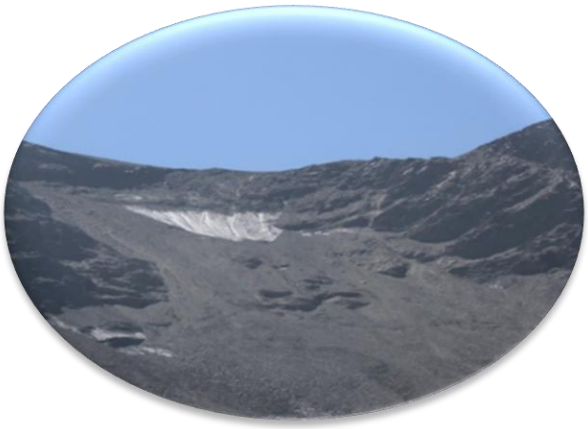
2016



2024



2025

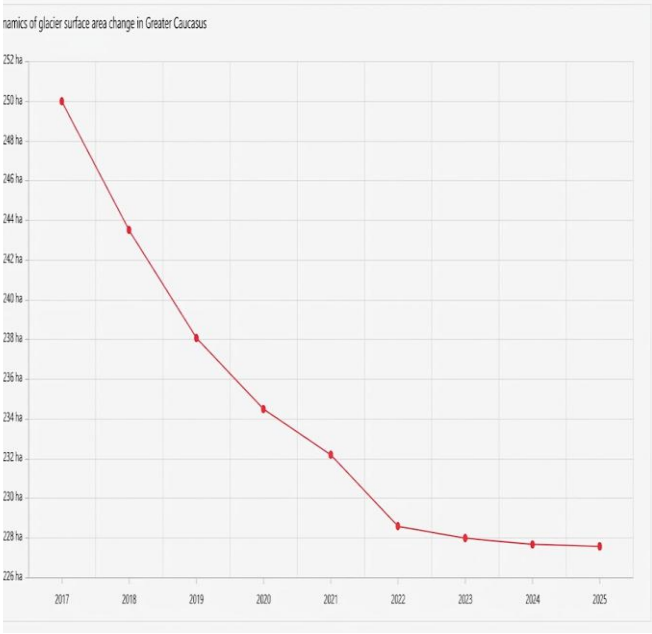


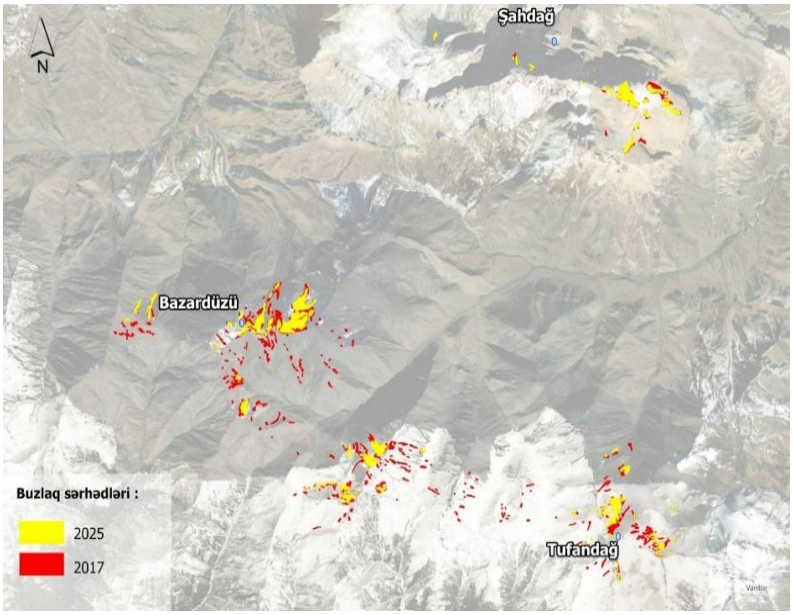
Each year, during the first half of March, snow measurements are carried out along five routes on the northeastern slopes of the Greater Caucasus to predict water levels during the spring-summer flood season. As indicated by recent data in the diagram, over the past 19 years, there has been a decline in water content within the snowpack. This is attributed to the reduction in frosty days in the mountainous regions of the Greater Caucasus, caused by climate change, leading to premature melting of snow. The multi-annual variation of water level in snow cover over the noth-eastern slope of the Greater Caucasus

In August, satellite imagery provides optimal conditions for annual monitoring of mountain peak glaciers. During this period, the retreat of seasonal snow reveals clear glacier boundaries. Using these images, glacier extents were delineated, and their areas were accurately measured for each monitoring period.

Glaciers located in the Greater Caucasus within the Azerbaijani borders were monitored for the 2017-2025 period.

(https://portaliis.gis.az/gisportal/apps/dashboards/a37a43dcf4f04e9e94efa3863557ba05)

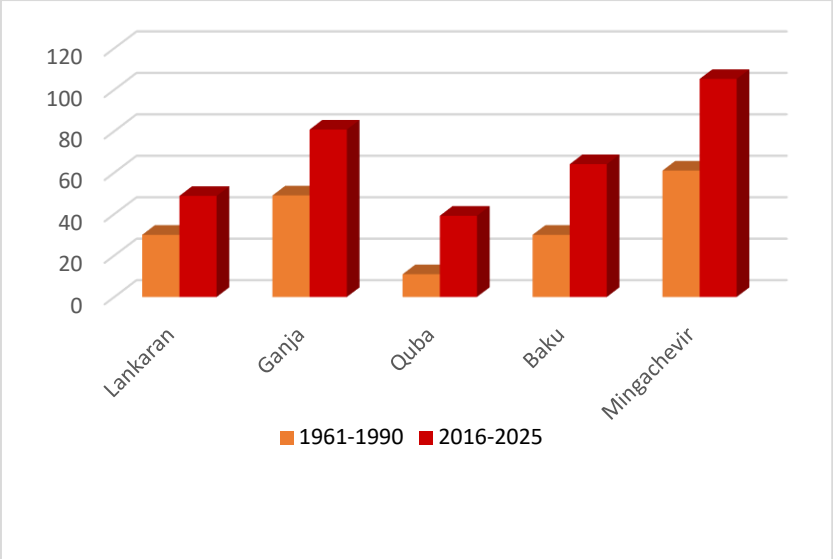




Dynamics of glacier surface area change in Greather Caucasus

2.2 Hot days

Over the past 10 years, due to climate change, the number of days with an average temperature above 30°C has increased by up to three times compared to the 1961-1990 average.



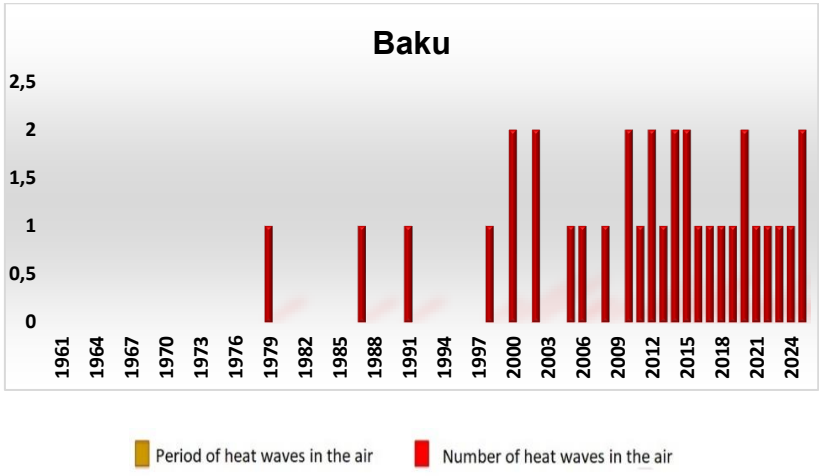
2.3 Heat wave

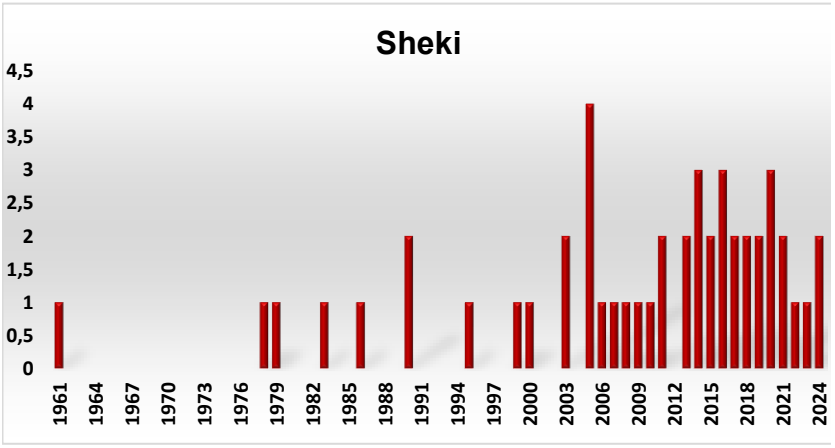
One of the key manifestations of modern climate change is the occurrence of heat waves (HW). Heat waves have significant impacts on various sectors such as health, agriculture, forestry, transport, and energy.

To detect these events, daily maximum air temperatures during the summer months (June-August) from 1960 to 2025 were analyzed. Currently, four meteorological stations, located in diverse climatic regions, are used for this analysis: Baku (moderately hot semi-desert and dry desert climate with dry summers)

Although heat waves have been observed across Azerbaijan from 1963 to 2025, their frequency has significantly increased in the last 25 years.

The occurrence of heat waves, both in terms of frequency and number, varies across time and regions. Notably, in 2010, 2018, 2019 and 2025 severe heat waves affected the entire country.



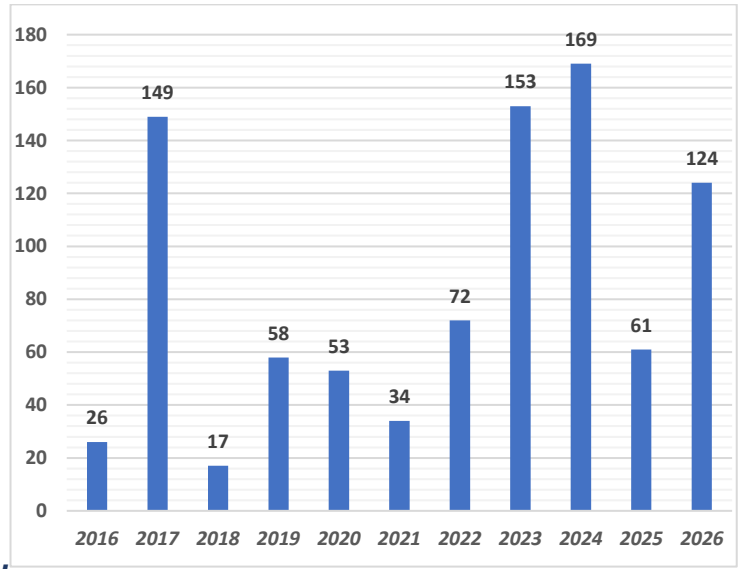


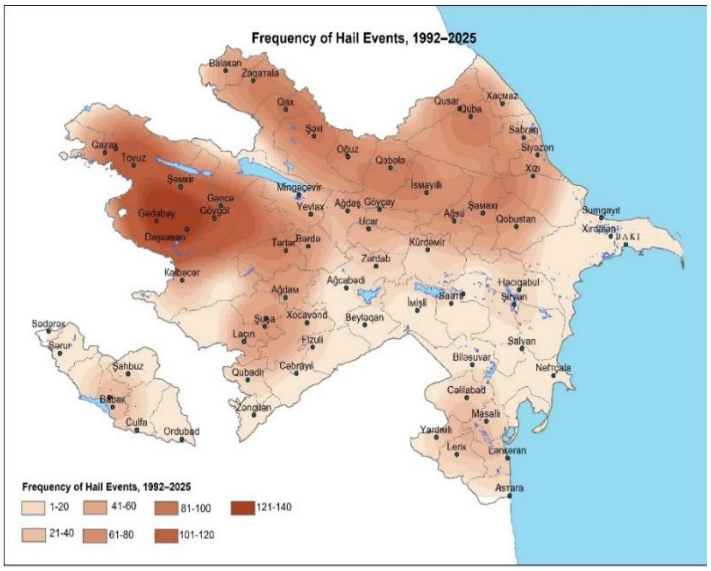
	Number of heatwaves, count		Average duration of heatwaves, days	
	1961-1990	1991-2025	1961-1990	1991-2025
Baku	2	31	6	8
Sheki	5	43	6	8

In the summer months of 2025, a maximum of 2 heat waves were observed. The longest-duration heatwave, persisting for 14 days, was recorded in Sheki. In Baku, the longest heatwave persisted for seven days, from 1 to 7 August. *(the heat waves was defined as a period lasting more than 5 days with maximum air temperature exceeding the average maximum temperature during the climatic norm period by 5 degrees).*

Hail cases

Over the past 25 years, the country has experienced a rise in dangerous atmospheric phenomena as a result of climate change. The number of days with hail has more than doubled compared to the historical average.





Frequency of hail events across the country

Hail events in the country are mostly observed in mountainous and foothill zones. Most Hail events occurred in the western, northern and northwestern regions.

2.4 Floods and Floods risk mapping

The Republic of Azerbaijan is among the regions with the highest incidence of floods. Floods are most intense in the mountain systems of the Greater and Lesser Caucasus, which cover nearly half of the country. The southern slopes of the Greater Caucasus and the highlands of the Nakhchivan region are particularly prone to flooding. In these mountain systems, the following flood-prone areas can be identified:

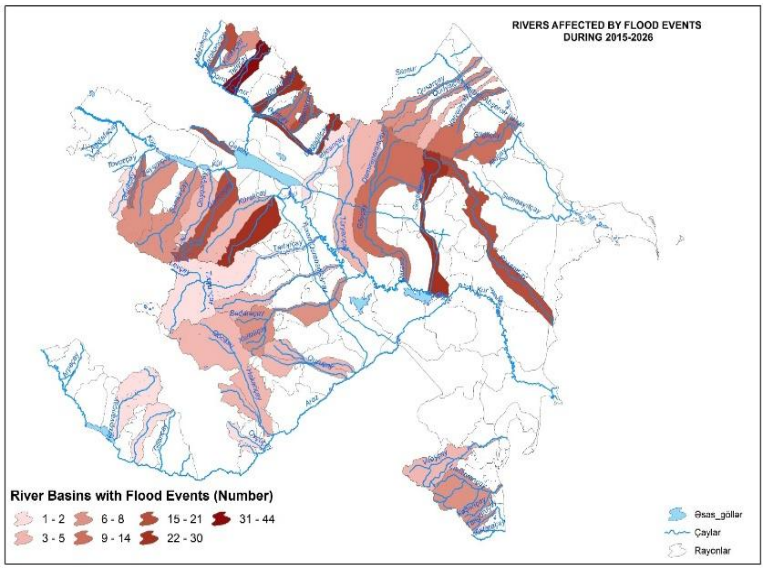
- Southern slope of the Greater Caucasus
- North-western of the Greater Caucasus
- North-eastern slope of the Lesser Caucasus (Shahdagh and Murovdagh ranges)
- South-western slope of the Lesser Caucasus
- Territorial rivers of Nakhchivan

Most streams occur in the highland areas of Sheki-Zagatala and Nakhchivan. 85-87% of streams occurred in the territory of the country caused by rainwater.

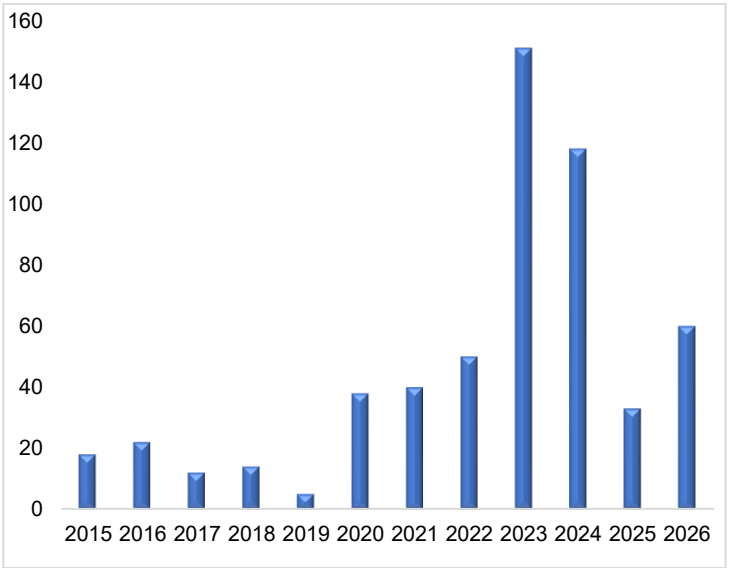
Flooding is also common along the Kura River, the southern slopes of the Greater Caucasus, and the rivers of the Lankaran-Astara region during high water periods.

Given that climate change models predict no increase in water resources, regulating reservoirs on large rivers is essential to manage peak flows and prevent flooding.

In the future, the planned construction of reservoirs on smaller rivers could play a significant role in flood reduction, providing an active tool in mitigating natural disasters.



Floods risk map (2015-2026)
(2015-2026)



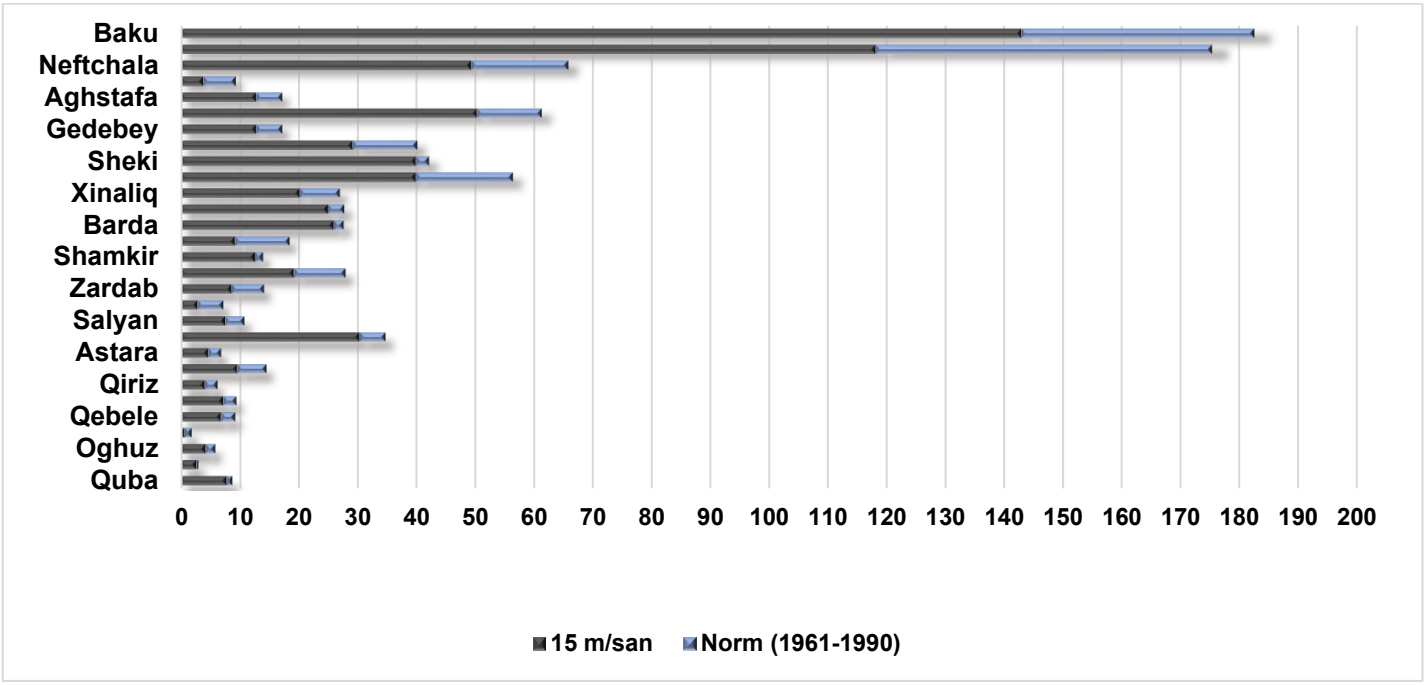
Annual number of Flood Events

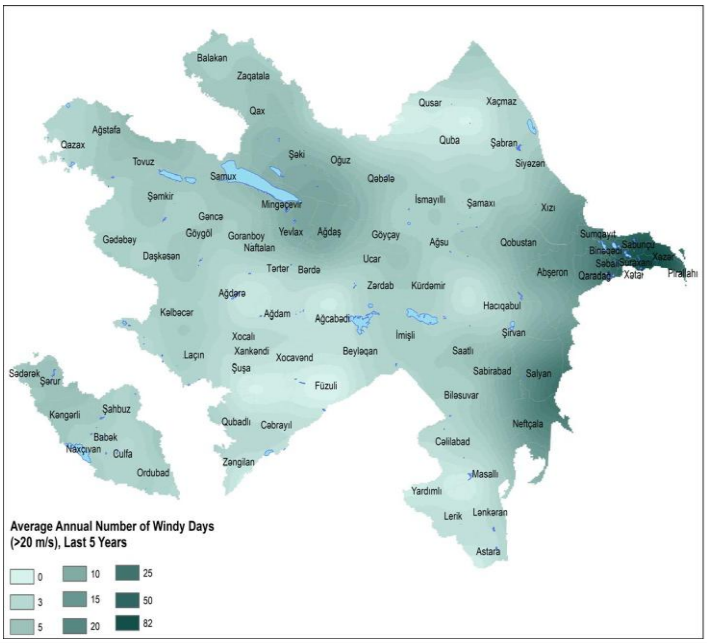
The graph shows a significant increase in the number of flood events during the last five years. In 2022, 50 flood events were recorded, followed by a sharp increase to 147 events in 2024, the highest value in the entire period shown. Overall, the data indicate substantial year-to-year variability. The exceptional peak in 2024 was followed by a considerable decrease in 2025. However, the number of events increased again in 2026, reaching 60 events, which is almost twice the 2025 level. Despite the decrease after the 2024 peak, the number of flood events in 2026 remains relatively high compared with

many previous years, highlighting the continued importance of flood monitoring, forecasting and early warning systems.

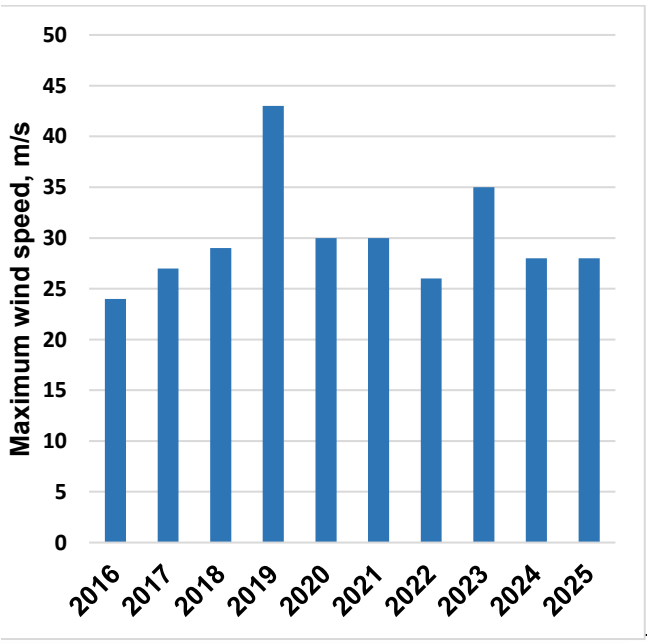
2.5 Strong winds

The number of days with strong winds exceeding 15 m/sec in the country has increased by 3.5 times compared to the 1961-1990 average. This increasing has been observed across all regions.





Strong winds with speeds of 20 m/s or higher over the Absheron Peninsula



Maximum wind speed in Baku and the Peninsula over the last 10 years (m/s)

Analysis of meteorological observations over the last 10 years shows that there is a certain variabi
maximum wind speed across years. During this period, the strongest wind was recorded in 2019 and rea
43 m/s, which is considered a hazardous meteorological event for the last decade. Such high-speed
are usually associated with strong cyclonic processes, severe atmospheric pressure differences, an
passage of intense weather fronts. Last year, the maximum wind speed was 28 m/s.

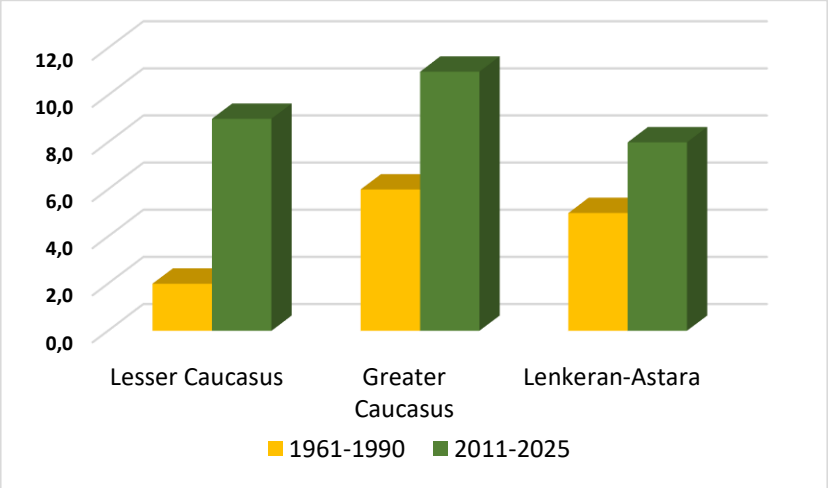
Year	Date	Rainfall Amount (mm)	Comparison with Monthly Norm (%)
2023	01 april	28	115
2024	21-22 october	86	306
2025	16 april	73	326
2026	27 march	120	508
2026	17 may	55	279
2026	31 august -01 september	22	524

Strongest heavy rains recorded in Baku in recent years

Strong rainfall

In recent years, due to the impact of climate change in Baku city, the intensity of short-duration torrential heavy rains has increased, and urban flooding has been observed as a result of precipitation significantly exceeding monthly norm indicators within a short period.

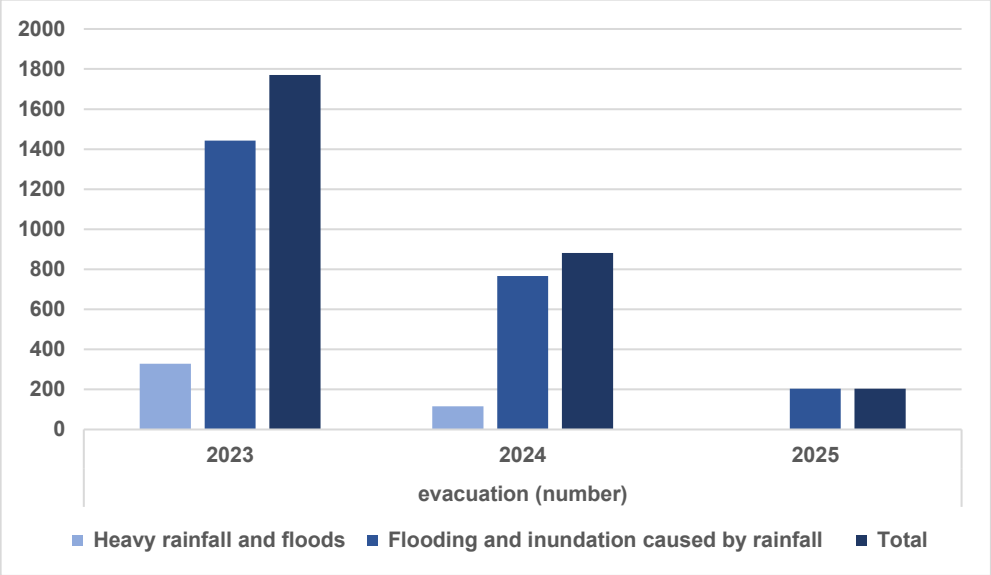
On April 16, 2025, as a result of the impact of a cyclone moving from Mediterranean regions, 73 mm of precipitation fell within 18 hours, amounting to 326% of the monthly norm. In the past period of 2026, such cases were recorded twice. Namely, on March 27, 2026, the daily precipitation amount reached 120 mm, equal to 508% of the monthly norm. During the month of March, total precipitation reached 640% of the monthly norm, approximately 6 times above normal. As a result, record indicators were renewed for both daily and monthly precipitation. On May 17, 2026, precipitation reached 40–55 mm, equal to 203–279% of the monthly norm. Overall, May precipitation reached 749% of the monthly norm. On August 31 – September 01, 2026, 18-22 mm of precipitation was recorded in Baku and Absheron Peninsula, forming 300-524% of the monthly norm.



Compared to the 1961-1990 average, the number of days with precipitation exceeding 30 mm in some areas has increased more than three times.

Over the past 15 years, the number of days with heavy rainfall across the country has significantly increased compared to the historical norm.

On the consequences of heavy precipitation in the territory of the Republic in 2023-2025 Data of the Crisis Management Center of the Ministry of Emergency Situations of the Republic of Azerbaijan



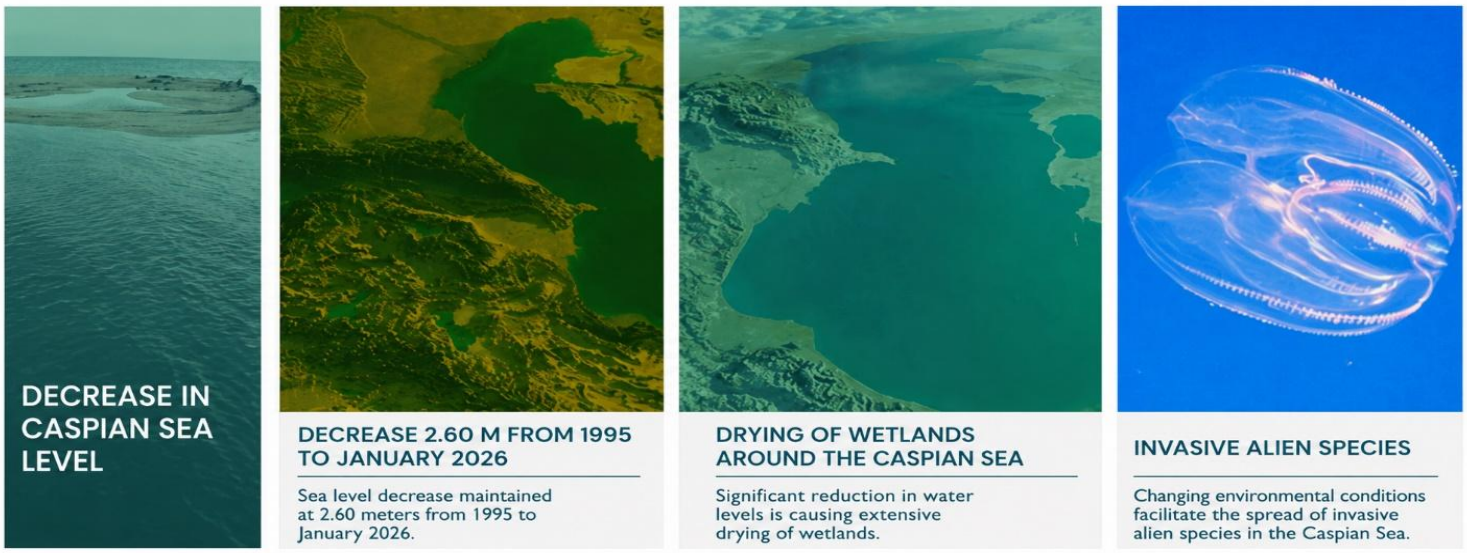
Information from the Crisis Management Center of the Ministry of Emergency Situations of the Republic of Azerbaijan

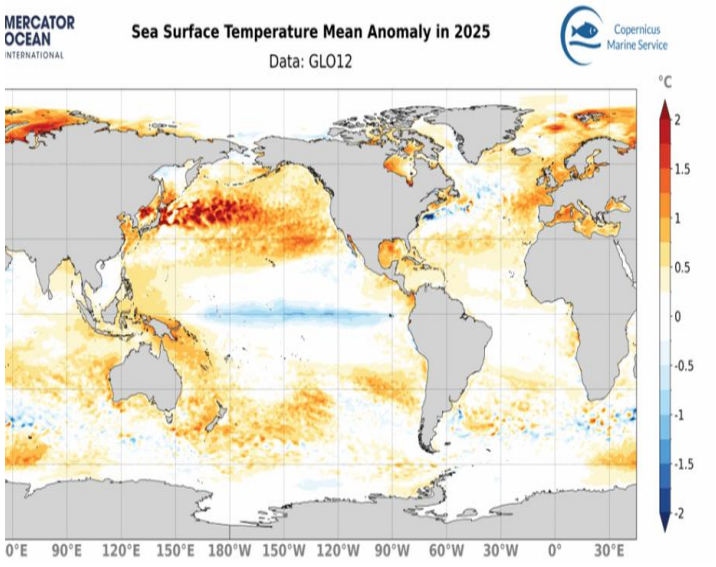
Decline in water level of the Caspian Sea

As a closed water basin, the Caspian Sea is subject to inevitable periodic changes in its water levels. The primary factor influencing these fluctuations is the climate of the Caspian basin, with changes in water levels largely depending on the elements of its water

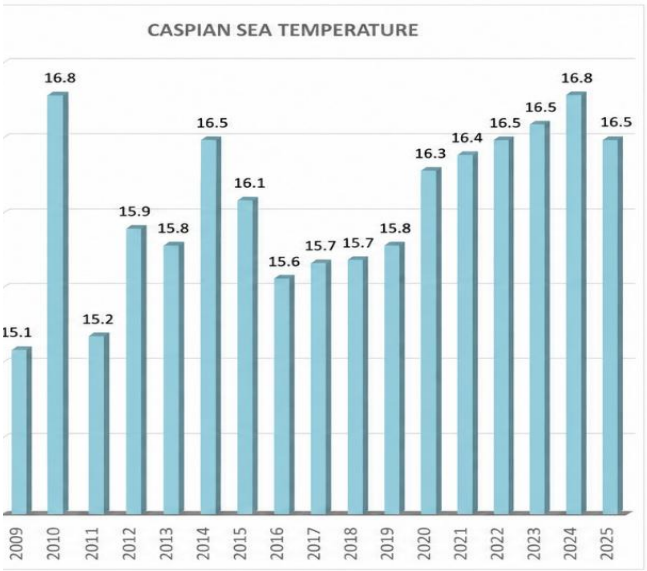
balance-namely, river inflows, precipitation, and evaporation. Tectonic movements on the seabed also play a role in these fluctuations.

Currently in parallel to reduction of precipitations and increase of evaporation, a decline in the flow of the Volga River, the main source of water for the Caspian Sea, is significantly contributing to the decrease in sea levels. The lowest recorded level in the 20th century was in 1977. However, from 1977 to 1995, the sea level rose by 2.5 meters, only to begin falling again in the following years. Since 2006, the Caspian Sea has experienced a continuous decline and from 1995 to the present day, the difference has made 2.60 meters. The decrease in the level has seriously affected the ecosystem of the sea and coastal area, including biologic al diversity, and coastal infrastructure, including cultural, tourism-recreational facilities.

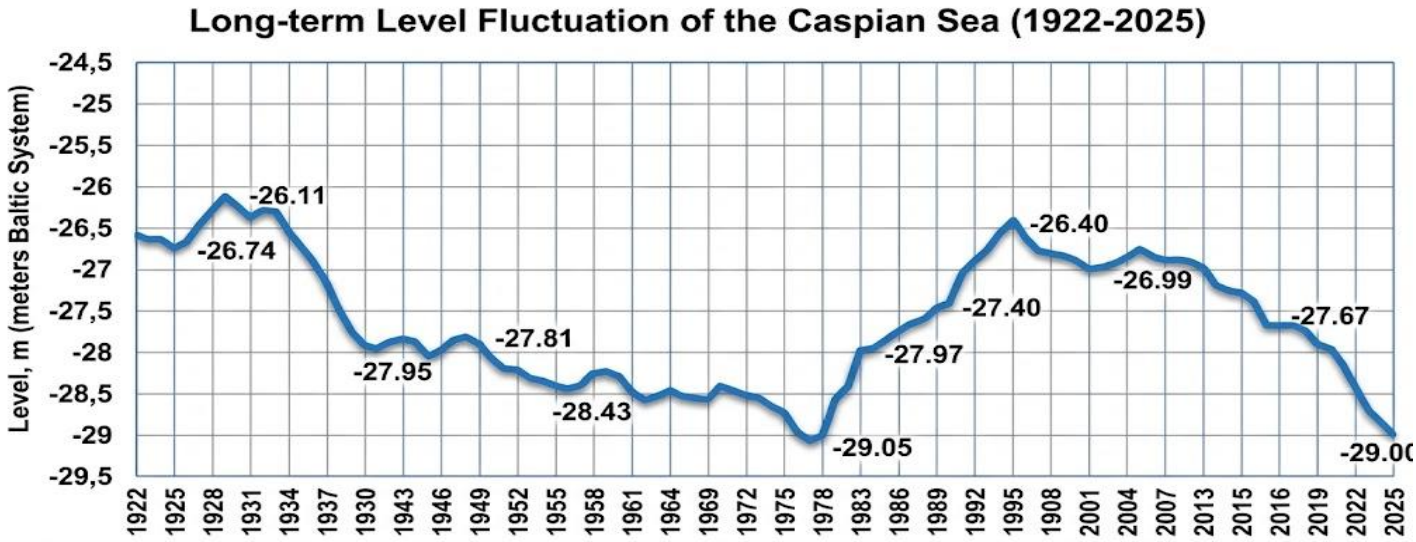




ı Temperature Bulletin\Global Ocean Highlights 2025
/www.mercator-ocean.eu/bulletin/ocean-temperature-bulletin-hts-2025/



nual mean water temperature of the Caspian Sea
d on data from the National Hydrometeorological
:e)



Multi-annual variation of level of the Caspian Sea. The Azerbaijani sector of the Caspian Sea coastline stretches for 850 km. Currently, 10 administrative districts of the country, including the Absheron Peninsula, are situated along the coast. According to unofficial estimates, more than 4 million people live in these coastal areas. Azerbaijan's largest cities, Baku and Sumgait, are located on the Caspian coast, along with over 75% of the country's industrial capacity.

Numerous forecasts regarding Caspian Sea level fluctuations exist in the literature. Most predictions were made during the decline in sea levels in the 1960s and 1970s. Forecasts in different periods were different. Some predicted a drop to -31.0 meters, while others suggested a rise to -25.0 meters or higher.

If the declining trend in sea level continues for a longer period, threats to certain economic sectors, especially maritime transport operations, as well as the ecological environment of the sea, cannot be ruled out. The level decline seriously impacts port operations. Ships cannot dock properly at coastlines, creating difficulties in freight and passenger transport. The level reduction also creates obstacles for maritime traffic in shallow coastal areas. Without proactive measures, this situation could lead to vessel grounding incidents.

As a result of the decline in sea level, the volume of water in the sea decreases, leading to several environmental problems. Water reduction in the basin causes increased concentration of pollutants. Furthermore, global warming and level drop lead to higher sea water temperatures, which accelerates eutrophication processes, ultimately posing a threat to marine biodiversity.

The sea level decline in the Caspian Sea under the impact of climate change has intensified further over the last 5 years. While the rate of decline was 11 cm/year in 2005-2020, this figure reached 22 cm/year during 2021-2025.

Currently some Caspian Sea level related predictions are based on different climate sceneries. Depending on used sceneries forecasts show that by the end of century several meter decline may occur in the sea level.

Therefore, there is need to develop more precise level sceneries according to existing and expected situation by input from basin countries and other scientific research institutions.

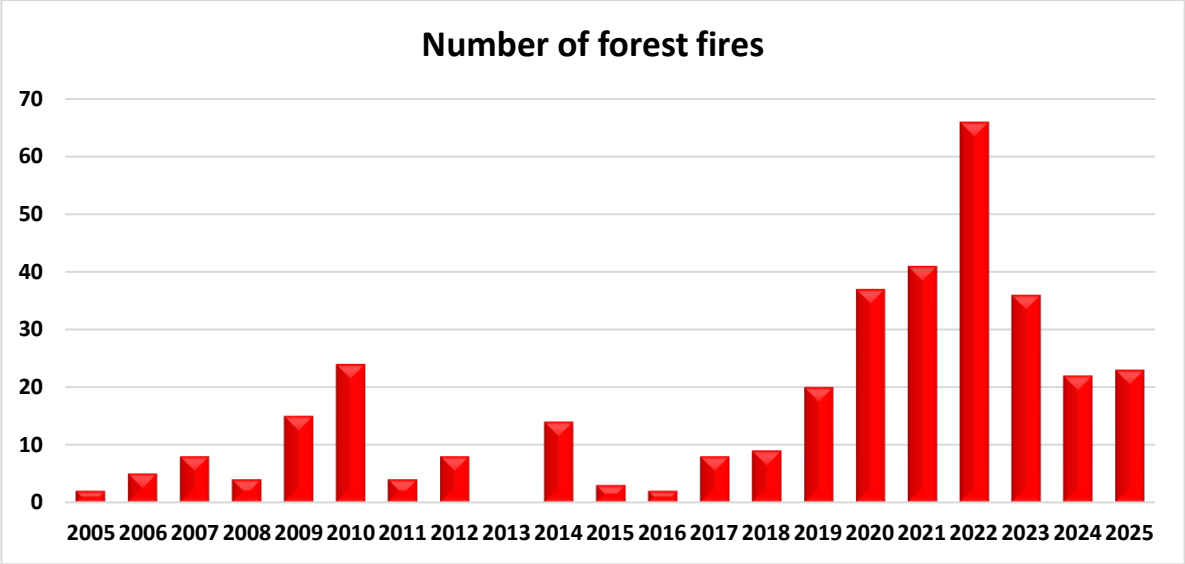
2.6. Forest fires

The forest area in Azerbaijan covers 1,040.7 thousand hectares, accounting for about 12% of the country's total land area. This translates to approximately 0.12 hectares of forest per person, which is four times less than the global average of 0.48 hectares. Forests typically thrive at elevations ranging from 50-100 meters to 1,700-1,800 meters and up to 2,000 meters. The republic's forests are predominantly located on the slopes of the Greater and Lesser Caucasus and the Talysh Mountains, with around 95% situated in mountainous regions and only 5% in the plains.

In recent years, forest fires have emerged as a significant environmental issue in Azerbaijan, mirroring a global trend. Historically, these fires were primarily caused by natural events such as lightning strikes, volcanic eruptions, and the spontaneous combustion of peat bogs during dry, hot periods. However, in recent decades, human negligence toward nature has increasingly contributed to these fires, exacerbated by global climate change.

Each year, forest fires ravage several hectares of this vital natural resource, leading to water shortages, heightened soil erosion, loss of biodiversity, deterioration of air quality, and an increase in carbon dioxide and other greenhouse gases in the atmosphere. Over the past 20 years, there has been an increase in both the number of fire incidents and the area affected by fires on the country's forest lands. The highest number of fires was recorded in 2022, with 66 incidents resulting in damage to approximately 870 hectares of land.

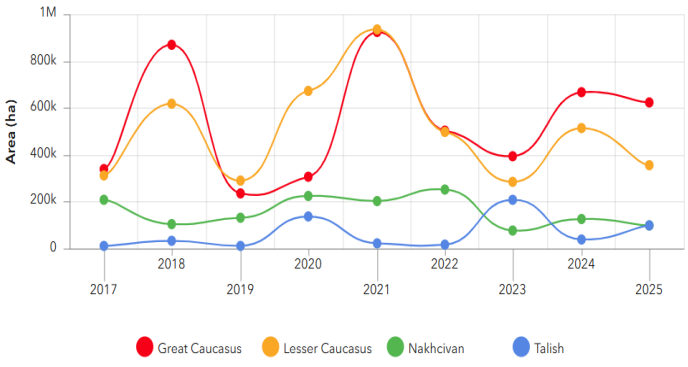
Recently, as in many countries around the world, forest fires in Azerbaijan have become one of the major environmental problems. These fires occur mainly due to irresponsible human activity in relation to nature against the background of climate change. Starting from the 2000s, an increase in the number of fire incidents and the area affected by fires on forest fund lands has been observed. The highest number of fire incidents occurred in 2022, when 66 fire incidents were recorded and nearly 870 hectares were damaged. Taking this into account, starting from 2023, the National Hydrometeorological Service under the Ministry of Ecology and Natural Resources began preparing forecasts and warnings regarding forest fire risks related to summer weather conditions and communicating them to relevant organizations and the public. As a result of forest fire forecasting, as well as coordinated inter-agency action and an increased number of control posts since that year, the number of fire incidents in the country has decreased significantly since 2023.



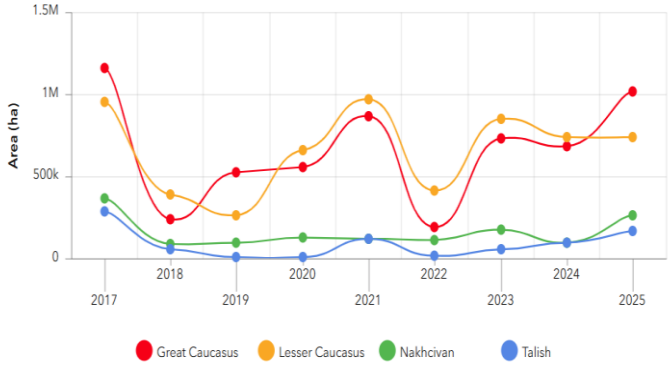
2.7 Monitoring of snow cover in mountainous regions

Snow cover monitoring covers the Greater Caucasus, Lesser Caucasus and Talish mountains. Comparative analysis utilized satellite imagery from January and February spanning the years 2017 to 2025

https://climatereport.az/az/section/monitoring-snow-cover-mountainous.

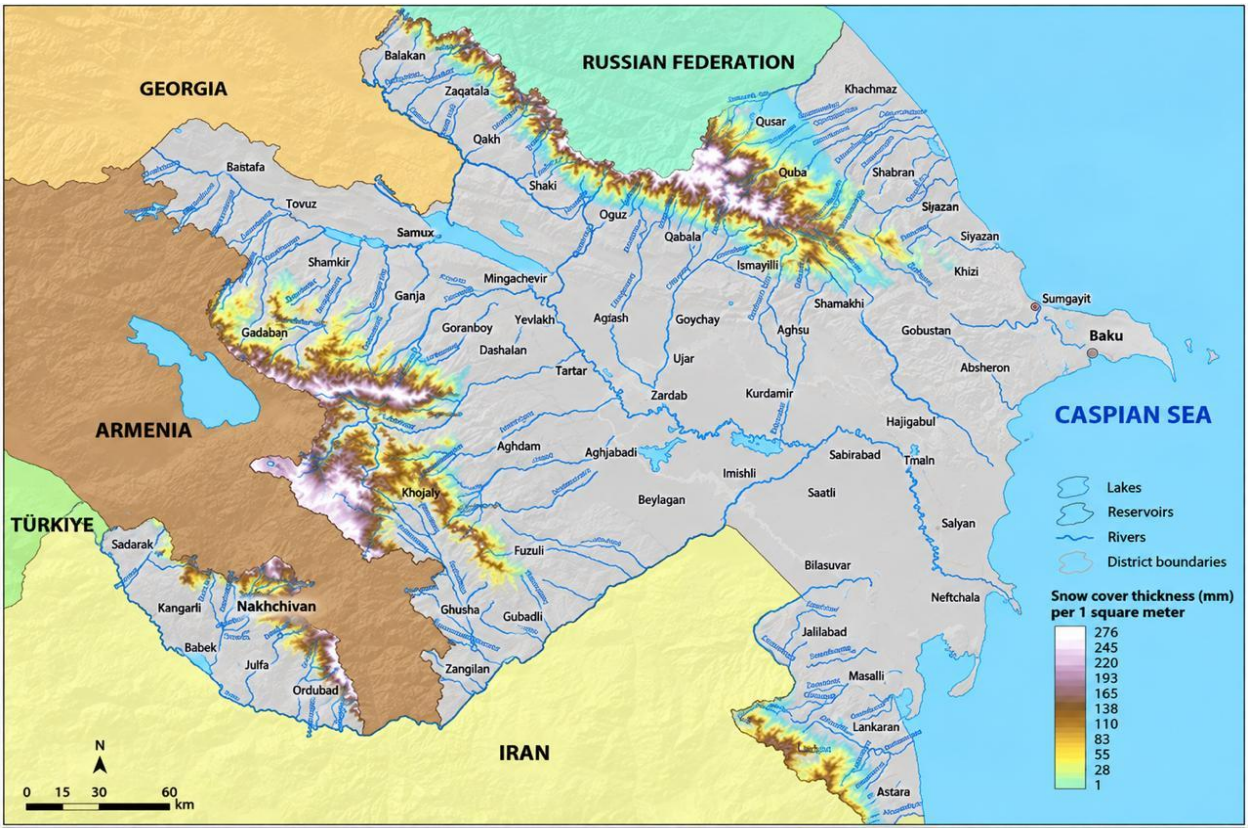


January



February

Total area of snow cover in January and February 2017-2025 (ha)



Distribution of the water content of the snow cover across the country (MENR, ADSEA)

A snow water content map was prepared based on the results of snow survey observati conducted in 2026. In preparing the map, indicators of snow cover thickness, density, and water cont recorded at 89 observation points along 15 snow survey routes, as well as a digital elevation model of area were used. When determining the spatial distribution of snow water content, the geograph location, absolute altitude indicators, and orographic features of the mountainous area were taken account. The prepared map allows for a visual assessment of the spatial distribution of water resour accumulated in the snow cover, analyzing changes in snow water content across different elevation be and identifying areas where snow reserves form unevenly. Assessing the spatial distribution of sn water content is of great importance for forecasting river feeding from snowmelt during the spring-sum season, water resource formation across river basins, and potential hydrological risks.

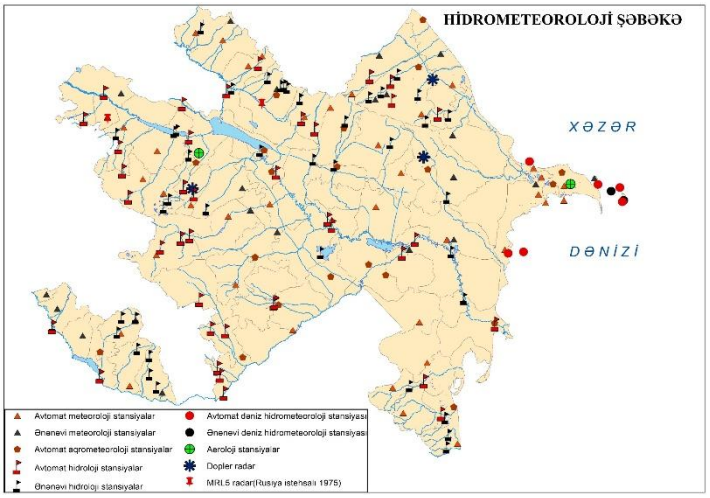
Strengthening climate information and multi-hazard early warning systems for enhancing resilience in Azerbaijan

The Early Warning System is one of the most suitable adaptation measures for the changing climate. In recent years, as across the world, the intensity and geographical coverage of hazardous hydrometeorological events have increased in the country territory. As climate-related disasters increase, the importance of Early Warning Systems also grows.

Modernization work in the observation network of the National Hydrometeorological Service was carried out within the framework of the "State Program on Social-Economic Development of Regions of the Republic of Azerbaijan for 2019-2023", the "Strategy for Social-Economic Development for 2022-2026", as well as the "I State Program on the Great Return to the liberated territories of the Republic of Azerbaijan" and State investment projects.

Namely, 45% of hydrological observation posts (40 hydrological posts), 82% of meteorological observation stations (79 meteorological stations), 67% of marine observation stations (6 posts), 60% of radiological observation stations (3 stations), and 100% of aerological observation stations (2 stations) have been automated. Currently, work is ongoing by the Service regarding the acquisition of new automated stations meeting modern requirements.

Observation type of automatic stations	2020	2026
Meteorological	34	79
Hidrolojical	0	40
Marine	0	6
Radar	0	3
Aerological	0	2





For the purpose of collecting, processing, analyzing, and visualizing data in a single center, a Situation Center was established at the National Hydrometeorological Service in 2021 within the framework of the State Investment Program.

Project on Strengthening Climate Information and Multi-Hazard Early Warning Systems for Enhancing Resilience in Azerbaijan for 2026–2031

GREEN CLIMATE FUND

Outputs and Activities

Output 1 – Strengthened delivery model for climate services and MHEWS

- **1.1** Strengthen institutional, policy and financial frameworks for climate services
- **1.2** Enhance climate data governance and risk knowledge

Output 2 – Strengthened observations, monitoring, modelling and prediction of climate and its impacts

- **2.1** Enhance capacity and equipment for observations and monitoring
- **2.2** Strengthen weather, water and climate modelling and impact-based forecasting
- **2.3** Develop urban climate services for health

Output 3 – Enhanced dissemination and communication of climate risk information and multi-hazard early warnings

- **3.1** Establish an impact-based multi-hazard early warning system

Output 4 – Enhanced climate risk management capacity

- **4.1** Build capacity to prepare for and respond to climate risks and hazards
- **4.2** Establish Forecast-based Financing (FbF)



COP29 Legacy in the Field of Climate Change Adaptation

In 2024, Azerbaijan's first National Adaptation Plan was submitted to the United Nations Framework Convention on Climate Change (UNFCCC).

Early Warning Systems (EW4All): On 13 November 2024, a High-Level Event on the Early Warnings for All (EW4All) initiative was convened by the UN Secretary-General within the framework of the World Leaders Summit.

Resilience to Multiple Hazards: On 16 November 2024, the COP29 Presidency, in collaboration with the United Nations Early Warnings for All team, organized a High-Level Event entitled "Enhancing Resilience through Strengthening Climate Data and Multi-Hazard Early Warning Systems."

Climate Finance and the Baku Adaptation Roadmap: COP29 achieved significant progress in the field of climate finance and introduced the Baku Adaptation Roadmap, bringing climate adaptation issues to the forefront of the global agenda. The agreed new climate finance goal opens up new opportunities for vulnerable countries to address their adaptation needs.

Urban Resilience and Global Declarations: To promote the development of climate-resilient infrastructure in cities, reduce emissions and support adaptation through Early Warning Systems, the COP29 Presidency put forward the following key initiatives:

- MAP Declaration for Resilient and Healthy Cities
- Green Digital Action

At COP29, held in Baku in 2024, concrete initiatives related to Green Digital Action and Early Warning Systems were put forward.

COP29 Declaration on Green Digital Action: On 16 November 2024, the Declaration on Green Digital Action was presented within the framework of COP29. Its objectives were to expand the application of digital technologies in climate action, strengthen data-driven decision-making and reduce the environmental impact of digital technologies.

Baku Dialogue on Water for Climate Action

Within the framework of the 13th Session of the World Urban Forum **(WUF13)**, an event entitled **"Early Warning and Climate-Resilient Cities"** was organized.

Chapter IV. Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

This chapter presents information on the financial, technology development and transfer, and capacity-building support needed and received by Azerbaijan under Articles 9–11 of the Paris Agreement. It also provides information on support needed and received for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including transparency-related capacity-building. The information is presented in accordance with paragraphs 130–145 of the modalities, procedures and guidelines (MPGs) for the Enhanced Transparency Framework (ETF) and the corresponding common tabular formats (CTFs).

The chapter describes Azerbaijan's national circumstances, institutional arrangements and country-driven strategies relevant to support needed and received, as well as the underlying assumptions, definitions and methodologies applied in compiling the information. It further presents information on financial, technology development and transfer, capacity-building, and transparency-related support, while identifying relevant data limitations and areas for continued improvement.

Financial support is important for the implementation of Azerbaijan's national climate priorities and commitments under the Paris Agreement. The chapter therefore considers both the resources already mobilized and the additional support required to address identified financing gaps, while distinguishing international support from domestic public resources and private investment. This approach reflects Azerbaijan's efforts to mobilize a range of financing sources while identifying areas where additional international support remains important for implementation.

The transfer and deployment of modern technologies, supported through international cooperation, are also important for achieving Azerbaijan's mitigation and adaptation objectives. The chapter presents technology development and transfer needs in areas identified through national climate planning, including NDC 3.0, and reports relevant technology support received where sufficient information is available. Particular attention is given to the enabling conditions for technology deployment, including access to finance, technological maturity, technical expertise, know-how and associated capacity-building.

Capacity-building needs and support received are presented in relation to the institutional, technical and human capabilities required for effective climate action. Transparency-related support is addressed separately in order to provide a clear account of support for implementation of Article 13 and to avoid double counting with broader capacity-building support.

1. National circumstances, institutional arrangements and country-driven strategies

1.1. Systems and processes used to identify, track and report support needed and received

In Azerbaijan, the Ministry of Ecology and Natural Resources (MENR) coordinates national climate reporting under the UNFCCC and the Paris Agreement, including the compilation of information required for the BTR. The identification and reporting of financial, technology development and transfer, capacity-building and transparency-related support is undertaken in cooperation with relevant central executive authorities, public legal entities, state-owned enterprises and other data providers. The established institutional arrangement for reporting on projects that externally funded through technical assistance or grants is defined by Cabinet of Ministers Decision No. 366 of 22 August, 2019, as amended. This mechanism mandates that central executive authorities and state-owned entities submit periodic and final reports on the implementation of projects funded through technical assistance or grants to the Ministry of Economy. However, the current system does not differentiate between climate-specific projects and other types of assistance, posing a challenge to climate finance tracking. As this mechanism covers external assistance more broadly and is not

climate-specific, the relevant project information requires additional screening to determine whether it relates to mitigation, adaptation, technology development and transfer, capacity-building or transparency support.

Since BTR1, this administrative framework has been strengthened through the establishment, in January 2025, of a centralized Registry of grants received by central executive authorities and state-owned legal entities on behalf of the Republic of Azerbaijan or the Cabinet of Ministers[50]. The Ministry of Economy is designated as the owner of the Registry, while its Information Technology and Data Management Centre acts as the operator. The Registry is intended to consolidate information on grant-funded projects in a single national source, support the preparation of reports and facilitate information exchange among public institutions.

The Registry contains information of direct relevance to the identification of international support, including the project purpose, principal international donor, beneficiary, total project budget, donor contribution, Government contribution, other financing sources, implementation period, expected results and project components. These records provide a stronger national basis for identifying candidate projects for subsequent climate-specific assessment and reconciliation with provider information.

A complementary national reporting mechanism applies to projects financed through borrowing undertaken on behalf of Azerbaijan or under a state guarantee. Under Cabinet of Ministers Decision No. 207 of 24 May 2022, entities using such financing submit semiannual and annual project reports to the Ministry of Economy, which consolidates the information for submission to the Cabinet of Ministers[51]. The reporting framework includes information on the creditor, total project cost, loan amount and use, Government contribution, financing terms, project components, implementation progress and financing planned for subsequent periods.

Taken together, these arrangements provide an important administrative foundation for FTC reporting. Rather than establishing an entirely separate system for financial and project data collection, Azerbaijan can build on existing national information flows and complement them with climate-specific screening, verification, QA/QC and ETF classification before relevant information is included in the CTFs.

A Technical Manual was developed by the international and local experts to support government institutions in preparing information on the financial, technology, and capacity-building support received and required for inclusion in the first BTR. This manual provides guidance on identifying, tracking, and reporting climate-related projects, aligning the reporting process with the transparency requirements under the Paris Agreement's ETF.

As part of its efforts to strengthen the institutional capacity for reporting on climate finance, technology transfer, and capacity-building support needed and received, Azerbaijan implemented the GEF-supported project "Capacity Building for Azerbaijan to Meet the Requirements of the Enhanced Transparency Framework of the Paris Agreement" (GEF Project ID 10043)[52]. The project was designed to strengthen institutional and human capacities for implementation of the ETF and to establish a tracking system supporting reliable national MRV arrangements.One of the outcomes of this project was the development of a national system for tracking financial, technology, and capacity-building support. The MRV incorporates the Financial, Technology and Capacity-building (FTC) component. The FTC component is structured around the eight reporting areas corresponding to CTF III.6–III.13 and includes functions for structured data entry, supporting-document management, review and feedback, revision, final approval, record history and data export. Through the project, the country also developed a draft financial strategy outlining methods for identifying funding sources and establishing a capacity-building and training programme to help national stakeholders better understand how to identify and track support received for climate-related

[50] https://nk.gov.az/uploads/doc/docs/677d2141d7781.pdf

[51] https://nk.gov.az/uploads/doc/docs/old/fa93545f2dee08bebbaaf713457db3df.pdf

[52] https://www.thegef.org/projects-operations/projects/10043

activities. These initiatives will significantly strengthen Azerbaijan's ability to meet its obligations under the ETF of the Paris Agreement by enabling more precise assessment of support needs, effective tracking of received financial, technology, and capacity-building support, and enhancing overall transparency in the reporting of climate actions.

The digital component and its principal functionalities were demonstrated to relevant national stakeholders. Practical capacity-building was also undertaken in 2025, bringing together 22 participants from more than 15 institutions. The programme included exercises on the identification and classification of support, application of CTF reporting parameters, climate-budget concepts and use of the digital system. These activities represented an important step from methodological development towards practical application of the FTC reporting arrangements. The component has been developed and demonstrated to relevant national stakeholders, while its regular institutional use and further operationalization remain areas for continued development.

Beyond supporting BTR preparation, the structured collection of information on support needed and received can strengthen the national information basis for identifying financing gaps, reducing duplication, linking support with national climate priorities and informing the prioritization of future support.

Moreover, several initiatives have been undertaken to implement Climate Budget Tagging (CBT) to improve the tracking and reporting of climate-related public expenditures. Work has also continued on approaches to improve the identification of domestic public resources relevant to climate action, including through Climate Budget Tagging (CBT) and related public-finance methodologies. At the present stage, CBT is treated as a developing methodological tool rather than as a fully institutionalized, economy-wide annual system. Its further operationalization could strengthen the identification of domestic resources available for implementation and, consequently, the assessment of residual international support needs.

The Ministry of Finance (MOF) has begun reporting climate-related expenditures by including a dedicated section in the Citizen Budget. This section highlights budget allocations aimed at combating climate change under the "2022-2026 Socio-economic Development Strategy" [53]. According to this strategy, the government allocated $374 million from the 2023 state budget for mitigation and adaptation measures, with 97% of the funds designated for public investment projects. In addition, the Asian Development Bank provided technical assistance to the MOF in supporting the implementation of CBT for 2023-2024.

However, there are some challenges and limitations in identifying, tracking, and reporting the support needed and received under the Paris Agreement's ETF. One of the primary challenges is the lack of capacity within relevant government agencies, state-owned enterprises (SOEs), and the private sector to report the required information. During the preparation of the first BTR, limited capacity and time constraints prevented the inclusion of all public sectors (such as education and health) as well as the private sector. To address these challenges, the capacity-building training for relevant government organizations needs to be conducted. Additionally, to cover the private sector, MENR intends to collaborate with the Central Bank as well as non-governmental stakeholders to develop institutional mechanisms that will enable the collection of information on financial support received by private companies through commercial banks and other financial institutions.

In parallel, Azerbaijan's broader sustainable-finance framework has continued to develop. The Central Bank's Sustainable Finance Roadmap[54] for 2023–2026 provides a framework for integrating climate and other environmental, social and governance considerations into the financial sector and for supporting the development of sustainable financial instruments.[8] The growing availability of sustainable-finance information also creates opportunities to improve the coverage of relevant private-sector financial flows in future reporting cycles.

[53] https://maliyye.gov.az/scripts/pdfjs/web/viewer.html?file=/uploads/static-pages/files/63b7dea4d5e69.pdf

[54] https://www.cbar.az/page-835/sustainable-finance-roadmap?language=en

In line with these national efforts to strengthen climate finance tracking and establish a structured environment for green investments, significant progress has been made in defining sustainable economic activities. To achieve strategic goals regarding sustainable development and the green transition, a Sustainable Finance Expert Group was established at the initiative of the Central Bank of the Republic of Azerbaijan, with the active participation of representatives from relevant government entities, including the Ministry of Finance and the Ministry of Ecology and Natural Resources. Developed by the Expert Group with the technical support of World Bank experts incorporating best international practices alongside the specific structural features of the national economy—the National Green Taxonomy of the Republic of Azerbaijan was officially approved by Resolution No. 126 of the Cabinet of Ministers on May 1, 2026[55]. Serving as a classification system that defines activities fulfilling climate, green, social, or sustainability objectives, the Taxonomy establishes a formal framework for environmental protection, enhances transparency in tracking climate finance support, and effectively directs financial resources toward the implementation of Nationally Determined Contributions (NDCs).

For ETF reporting purposes, classification under the National Green Taxonomy is not considered automatically equivalent to classification as mitigation, adaptation or cross-cutting support. The Taxonomy provides an important national reference for identifying sustainable activities, while further methodological work is needed to map relevant taxonomy categories to the specific reporting parameters applicable to support needed and received under the Paris Agreement.

Despite progress since BTR1, further work is required to ensure comprehensive and regular coverage of relevant support flows and needs. Existing administrative systems contain substantial information on grants, technical assistance, sovereign and state-guaranteed financing and public resources, but were not established specifically for climate reporting. Their effective use for ETF purposes therefore requires climate-specific screening, consistent classification, reconciliation across national and provider sources, and appropriate QA/QC.

Coverage of relevant private-sector information also remains an area for further development. Continued engagement with the Central Bank, financial institutions and other relevant stakeholders can support a more complete understanding of private financial flows while maintaining a clear distinction between commercial investment and international support received under the ETF.

Another significant challenge is the lack of capacity to identify and calculate the grant equivalent of financial support provided through instruments other than direct grants. The MENR will need to work closely with the MOF and the Central Bank to develop the necessary expertise and capacity in this area.

The institutional roles and principal national data sources relevant to the compilation of information on support needed and received are summarized in Table X. The table distinguishes established mandates and existing data holdings from functions that remain subject to further operationalization for FTC reporting.

Institution / data source	Established role / information available
Ministry of Ecology and Natural Resources (MENR)	Coordinates national climate reporting under the UNFCCC and Paris Agreement; compiles BTR information; leads climate-specific methodological work
Ministry of Economy	Owner of the national Grant Registry; receives information under Cabinet Decision No. 366 on technical assistance/grants and Decision No. 207 on projects financed through sovereign or state-guaranteed borrowing

[55] https://e-qanun.az/framework/61767

Ministry of Finance	Holds State Budget, fiscal and other public-finance information
Central Bank of Azerbaijan	Sustainable Finance Roadmap, National Green Taxonomy-related financial-sector framework and sustainable-finance information
Sector ministries, public legal entities and A state-owned enterprise (SOEs)	Hold project, sectoral-policy, implementation, technology and capacity information
International funds, development partners and project records	Provider-side project documentation, financial status, implementation information and results

Table X

1.2. Country priorities and strategies

Azerbaijan has ratified the Paris Agreement and submitted its First NDC in 2017. Azerbaijan has progressively strengthened its nationally determined contributions under the Paris Agreement and submitted its NDC 3.0[56] on 5 November 2025, establishing an economy-wide target to reduce greenhouse gas emissions by 40 per cent by 2035 compared with 1990 levels. This represents an advancement of the previous 40 per cent reduction objective for 2050 and is accompanied by more detailed sectoral decarbonization pathways and implementation conditions. NDC 3.0 provides the principal current country-driven framework for identifying Azerbaijan's mitigation-related financial, technology development and transfer, and capacity-building needs. It recognizes that achievement of the 2035 target will require significant investment across sectors and identifies finance, technology and innovation, capability building, governance and climate transparency as key enabling conditions for implementation.

The financing approach set out in NDC 3.0 combines national and international resources. Azerbaijan envisages the use of government resources, local and international investment, foreign direct investment, public-private partnerships and power purchase agreements, while recognizing that access to international finance through multilateral development banks and climate investment funds, including highly concessional finance and grants, will be critical to supporting implementation of the country's decarbonization pathway.

NDC 3.0 also identifies technology availability, technological maturity, access to finance, technology transfer and human-capital capabilities as important conditions for the deployment of advanced climate technologies. It highlights the role of international cooperation, knowledge exchange, research and development and partnerships with technology providers in supporting the transition. Capability building is similarly recognized as an enabling condition, particularly for developing the specialized technical, institutional and project-development skills required to implement and maintain emerging low-carbon technologies.

This country-driven approach to technology planning is being further strengthened through Azerbaijan's participation in the fifth phase of the Technology Needs Assessment (TNA)[57] process. Azerbaijan rejoined the TNA process in 2025 to update its earlier assessment, reassess national technology priorities and identify technologies that can support implementation of its climate targets and low-emission development. The process is expected to identify and prioritize technologies, assess barriers and enabling conditions and develop Technology Action Plans and implementation

[56] https://unfccc.int/sites/default/files/2025-11/NDC%203.0%20Report_Azerbaijan.pdf

[57] https://tech-action.unepccc.org/country/azerbaijan/

concepts, providing an additional basis for identifying technology development and transfer needs under Article 10 of the Paris Agreement.

Azerbaijan's climate strategy is closely linked to its NDCs, which outline the country's goals for reducing greenhouse gas emissions and adapting to climate change. The priorities under the NDCs include increasing the share of renewable energy in the national energy mix, enhancing energy efficiency across sectors, and implementing adaptation measures in vulnerable sectors such as water, agriculture, and coastal areas.

A clean environment and "green growth" have been recognized as one of the country's five national priorities through 2030. This priority includes two key strategic objectives: ensuring a high-quality ecological environment and developing green-energy zones. The “Azerbaijan 2030: National Priorities for Socio-Economic Development”[58] therefore provides the broader national development framework within which climate mitigation, adaptation and green-transition measures are implemented.

The "Socio-Economic Development Strategy for 2022-2026," approved by the President of the Republic of Azerbaijan in 2022, emphasizes key measures to address climate change. These include promoting the use of environmentally friendly vehicles, advancing green technologies, and expanding renewable energy sources. The strategy also focuses on the efficient management of waste, conducting an inventory of greenhouse gases (GHGs), and developing a comprehensive monitoring, reporting, and verification (MRV) system. Additionally, it outlines the creation of a national climate change database, the preparation of a "State Program for Low-Carbon Development," and the formulation of a National Adaptation Plan for sectors vulnerable to climate impacts. Furthermore, the strategy calls for research and proposals on the use of carbon capture, utilization, and storage (CCUS) technologies in the energy sector to ensure greenhouse gas emissions meet international standards.

These national development priorities are reflected and further elaborated in NDC 3.0, which links sectoral mitigation measures to implementation requirements across the power, oil and gas, buildings, transport, industry, waste and AFOLU sectors. Adaptation priorities are further defined through Azerbaijan's Initial National Adaptation Plan, submitted in 2024. The Initial NAP identifies measures for reducing climate vulnerability and strengthening resilience and sets out short-term priority actions for 2025–2026 and medium-term priorities for 2027–2030.

These adaptation priorities are supported by sustained national investment in hydrometeorological observation, climate information and early-warning infrastructure. Modernization of the National Hydrometeorological Service's observation network has been undertaken through state investment projects and national development programmes, including the State Programme on Socio-Economic Development of the Regions for 2019–2023, the Socio-Economic Development Strategy for 2022–2026, the First State Programme on the Great Return to the liberated territories and the National Strategy on Efficient Use of Water Resources[59]. These investments have strengthened the national basis for climate monitoring, forecasting and early warning and provide an important foundation for further scaling adaptation action through international cooperation and support.In the power sector, Azerbaijan has set a target to increase the share of renewable energy in installed electricity-generation capacity to 30 per cent by 2030. Recent official projections[60] indicate that the share may exceed this target as the current renewable-energy project pipeline is implemented. The country's broader green-energy policy also includes the development of green-energy zones in Karabakh and East Zangezur, where renewable-energy deployment, energy efficiency and environmentally sustainable infrastructure form part of the reconstruction and development framework. Taken together, NDC 3.0, the Initial NAP, the Azerbaijan 2030 National Priorities, the 2022–2026 Socio-Economic Development Strategy and the ongoing TNA process provide the principal country-driven policy basis for identifying financial, technology development and transfer, and capacity-building support needs in BTR2.

[58] https://president.az/en/articles/view/50474

[59] https://president.az/az/articles/view/67069

[60] https://minenergy.gov.az/en/xeberler-arxivi/00535

1.3. Domestic public finance and sustainable-finance context

Domestic public resources constitute an important part of Azerbaijan's climate-implementation context and are relevant to the assessment of resources already available for specific mitigation and adaptation measures. The 2026 State Budget[61] allocates approximately AZN 415.8 million under the functional classification of environmental protection. This includes expenditure for biodiversity protection, hydrometeorological activities, forestry, land-related activities, environmental management, and cleaning and wastewater collection and treatment.

Within this functional category, selected allocations include approximately AZN 11.7 million for hydrometeorological activities, AZN 21.2 million for forestry and AZN 10.5 million for biodiversity protection. The budget also provides AZN 285.7 million for cleaning, wastewater collection and treatment. These allocations[62] demonstrate the scale of domestic public expenditure in sectors that may contribute to mitigation, adaptation or climate resilience; however, their climate relevance depends on the objectives and content of the underlying activities.

The State Budget also provides financing through dedicated funds and sectoral programmes that may contain climate-relevant activities. These include the Environmental Protection State Fund, with an allocation of approximately AZN 5.84 million in 2026, and the Forest Protection and Reproduction Fund, with an allocation of AZN 4.5 million. Other potentially relevant budget instruments include funds for public transport, vehicle utilization, protected areas and aquatic bioresources, as well as expenditure for agricultural insurance and water-management infrastructure.

These budgetary allocations are not treated automatically as climate finance. For the purposes of this chapter, domestic public expenditure is considered relevant only where an activity-level assessment establishes a clear contribution to mitigation, adaptation or both. Accordingly, the full value of an environmental, transport, agricultural or water-related budget programme is not assumed to represent climate expenditure solely on the basis of its budget classification.

Domestic public resources are also distinguished from international financial support received. They are therefore not reported as support received under CTF III.7. Where sufficiently attributable to the same measure or programme, however, domestic resources may be taken into account when assessing resources already available and determining the residual financial support needed under the methodology described in section 2.3.

Work has continued on approaches to improve the identification of climate-relevant public expenditure, including through Climate Budget Tagging (CBT) and related public-finance methodologies. At the present stage, CBT is treated as a developing methodological approach rather than as a fully institutionalized, economy-wide annual system. Its further operationalization could improve the consistency with which relevant domestic public resources are identified and linked to specific mitigation and adaptation priorities.

In parallel, Azerbaijan's sustainable-finance framework has continued to develop. The Central Bank's Sustainable Finance Roadmap[63] for 2023–2026 aims to integrate climate-related and other environmental, social and governance considerations into financial-sector regulation, strategic decision-making and risk management, while supporting the development of a sustainable-finance ecosystem. Implementation of this agenda has been supported by additional guidance for financial institutions, including the 2025 Guidelines on Green and Sustainability-linked Loans[64].

A further important development is the National Green Taxonomy[65] of the Republic of Azerbaijan, approved by Cabinet of Ministers Decision No. 126 of 1 May 2026. The Taxonomy was developed

[61] https://e-qanun.az/framework/61119

[62] https://static.president.az/upload/Files/2025/12/29/e75e554bc1917469433fe63ed0a91922_9088434.pdf

[63] https://www.cbar.az/press-release-4116/mrkzi-bank-dayaniqli-maliyy-uzr-yol-xritsini-tsdiq-etmisdir?language=en

[64] https://www.cbar.az/press-release-5002/mrkzi-bank-trfindn-yasil-v-dayaniqliliqla-laqli-kreditlr-uzr-tlimat-sndi-tsdiq-edilib?language=en

[65] https://nk.gov.az/uploads/doc/docs/69f835bebfa06.pdf

with participation of relevant public institutions and technical support from World Bank experts and establishes a national classification framework for environmentally sustainable economic activities.

The Taxonomy establishes an activity-based national classification framework for environmentally sustainable economic activities. It addresses six environmental objectives: climate-change mitigation; climate-change adaptation; sustainable management and protection of water and marine resources; transition to a circular economy; pollution prevention and control; and protection and restoration of biodiversity and ecosystems. Its methodology applies activity-level technical assessment criteria together with requirements relating to substantial contribution, avoidance of significant harm to other environmental objectives and minimum safeguards.

For the purposes of this chapter, the National Green Taxonomy is treated as a complementary domestic sustainable-finance framework. Taxonomy alignment is not considered automatically equivalent to classification as mitigation, adaptation or cross-cutting support under the ETF, nor does such alignment by itself establish that an associated financial flow constitutes international support received. The Taxonomy instead provides a complementary national framework that can improve consistency and comparability in the identification of sustainable economic activities and may inform future refinement of climate-finance screening methodologies.

Taken together, State Budget information, evolving CBT approaches and the sustainable-finance framework provide an increasingly structured basis for understanding domestic resources relevant to climate implementation.

Budget item	2026 allocation	Relevance to FTC analysis
Environmental protection — functional classification	AZN 415.784 million	Broad environmental expenditure envelope; **not a climate-finance total**
Hydrometeorological activities	AZN 11.688 million	Potential adaptation, climate-information and early-warning relevance
Forestry	AZN 21.220 million	Potential mitigation/removals and adaptation relevance
Biodiversity protection	AZN 10.501 million	Potential ecosystem-based adaptation and resilience relevance
Cleaning, wastewater collection and treatment	AZN 285.715 million	Potential adaptation and waste-related mitigation relevance, depending on activity
Environmental Protection State Fund	AZN 5.844 million	Potential mitigation, adaptation and technology relevance; activity-level screening required
Forest Protection and Reproduction Fund	AZN 4.500 million	Potential LULUCF and adaptation relevance
Agricultural insurance premiums financed from the State Budget	AZN 12.300 million	Potential climate-risk-management/adaptation relevance; **not automatically climate expenditure**

Table X. Selected 2026 State Budget allocations with potential relevance to climate action

2. Underlying assumptions, definitions and methodologies

The underlying assumptions, definitions and methodologies applied to information on support needed and received are aligned with paragraph 131 of the MPGs and the corresponding CTFs

contained in decision 5/CMA.3[66]. The methodology builds on the approach applied in BTR1 and incorporates subsequent methodological, institutional and digital developments.

2.1. Data sources and compilation approach

Collecting data and making use of the outputs requires engagement with the stakeholders including government ministries, agencies, local governments and communities, and support users or beneficiaries. The information on financial, technology transfer and capacity building support received and needed was collected from organizations that are either involved in channeling support to finance action, build capacity or apply technologies or organizations that are benefiting from the finance, capacity building or technology-related support.

As the institutional arrangements are still in development as a UNFCCC National Designated Authority, the MENR took the lead on establishing data flows, expertise and in processing and compiling information on support for this report. Other central government organizations, as well as public legal entities and state-owned companies (SOEs) provided required information on support received and needed to the MENR.

Given that financial support encompasses not only grants but also concessional and non-concessional loans, equity, guarantees, insurance, and other financial instruments, the MOF, along with the State Agency for the Management of Public Debt and Obligations under the MOF, served as key data providers on support received through government debt instruments.

This is an interim step in order to do the first compilation and analysis for Paris Agreement Reporting. It can be refined and then parts or all of the tasks handed over to more appropriate organizations when the data flows, expertise and tools are better defined.

MENR coordinates the climate-specific compilation of this information for BTR reporting. Existing national systems for grants, externally financed projects and public finance provide source information, while sectoral institutions, state-owned enterprises, project records and provider documentation provide activity-level information within their respective areas of competence. The Ministry of Economy holds relevant information generated through the Grant Registry and established reporting arrangements for externally financed projects, while the Ministry of Finance provides relevant State Budget and public-finance information. Compared with BTR1, this approach, although not operationalized, reduces reliance on one-off data collection by building progressively on existing national information flows and the digital FTC Support component described in section 1.1.

Climate-specific screening, classification, reconciliation and QA/QC are undertaken for ETF reporting. The digital FTC Support component provides a structured environment for progressively organizing these information flows; its routine inter-institutional use remains under development.

For national compilation purposes, two related but distinct information streams are considered:

- support needed, which is primarily forward-looking and reflects identified financial, technology development and transfer, capacity-building and transparency-related requirements; and
- support received, which reflects support identified through national administrative records and project/provider information and subsequently screened, classified and reconciled for reporting purposes.

This distinction allows information on future requirements and financing gaps to be assessed separately from information on support already committed or received.

2.2 Definition of “support”

For the purposes of this report, the term “received and needed support” refers to climate-related support aimed at one of the following objectives:

[66] https://unfccc.int/sites/default/files/resource/cma3_auv_5_transparency.pdf

Mitigation of Climate Change Impacts: This includes measures and activities aimed at reducing greenhouse gas emissions or enhancing the natural absorption of these gases. Examples include the adoption of renewable energy sources (solar, wind, hydro), energy efficiency measures in industries or buildings, and promoting the use of electric vehicles and public transportation to reduce private car use.

Adaptation to Climate Change: This includes measures and activities aimed at increasing the resilience of human and natural systems against the adverse effects of climate change. Typical examples include the implementation of early warning systems for natural disasters (e.g., hurricanes, storms, heatwaves), the construction of coastal defense structures (such as levees or nature-based solutions like mangroves), and the cultivation of crops resilient to water and heat stress.

Cross-cutting support: These refer to support that combine both mitigation and adaptation objectives.

Forms of support:

Received or needed support for climate action can be in four forms:

1. **Financial Support:** Financial support includes all funds provided, received or needed through various financial instruments for implementing mitigation and adaptation activities, including grants, concessional and non-concessional loans, equity, guarantees, insurance, etc.[67]

2. **Technology Development and Transfer Support:** Climate-related projects encompass not only infrastructure projects but also the application of technologies, development of policies, strategies, roadmaps, and projects for training and capacity building. Support for technology development and transfer involves promoting, facilitating, and financing the acquisition and implementation of climate technologies. Climate technologies include those aimed at reducing emissions (e.g., renewable energy sources like wind, solar, and hydro) and combating the adverse effects of climate change (e.g., drought-resistant crops, early warning systems, sea walls, etc.).[68]

3. **Capacity Building Support:** This includes assistance aimed at creating, developing, strengthening, and improving the capacity needed to implement climate actions in line with national needs and priorities. Capacity-building measures can strengthen institutional capacities (e.g., integrating climate change considerations into national planning and budgeting) and technical capacities (e.g., using technical assessment, evaluation, and planning tools) needed for mitigation and adaptation actions.[69]

4. **Support for the Implementation of Article 13 of the Paris Agreement and Transparency Activities, including Capacity Building for Transparency:** This involves both financial and capacity-building support specifically directed towards implementation of the ETF, including institutional arrangements, data systems, methodological development, reporting, QA/QC, training and other transparency-related functions. Such support is separately identifiable in order to avoid double counting with broader capacity-building support..

2.3. Identification and estimation of support needed

The methodology for identifying support needed builds on the approach established for BTR1 and is applied in a country-driven manner using national climate priorities, including NDC 3.0, the Initial NAP, the TNA process and relevant sectoral strategies and plans.

[67] This also includes projects implemented through financial flows for financial support, technology, and capacity building, which are therefore reflected in financial records.

[68] Support for technology development and transfer includes assistance that is not solely provided through financial aid and therefore does not appear as financial flows in accounts. This distinction is made to avoid double counting.

[69] Capacity-building support includes assistance that is not exclusively provided through financial aid and therefore does not appear as financial flows in accounts. This distinction is made to prevent double counting.

For financial support needs, where sufficiently reliable and comparable cost and resource information is available, the following relationship is applied: *Needed support = total resource requirements (financial costs/technology needs/capacity-building needs) – available resources (budgetary resources) – resources secured or reasonably expected on the basis of existing commitments (private sector involvement, international commitments).*

Available resources may include relevant domestic public resources and other financing already allocated to the same activity or programme. Secured or reasonably expected resources may include documented private or international financing commitments. Resources are deducted only where they relate to the same measure, programme or investment requirement being assessed. Aggregate domestic or private climate-finance figures are therefore not automatically deducted from aggregate international support needs.

The calculation is applied at the level at which sufficiently robust information is available. Where total investment requirements, available resources or secured financing cannot be reliably quantified, the corresponding support need is reported qualitatively rather than assigned an unsupported monetary value.

The residual-gap calculation is principally a financial-support methodology. Technology development and transfer and capacity-building needs may be identified and reported qualitatively where monetary valuation would not provide a meaningful representation of the requirement.

This approach maintains a distinction between the total cost of implementing a climate measure and the portion for which additional international support is needed.

Defining the roles of relevant data providers and stakeholders is important for maintaining clear and consistent institutional arrangements for FTC reporting. MENR coordinates the compilation and consolidation of information on support needed and received for BTR reporting, in cooperation with relevant national institutions and data providers. The reporting on support was completed through a two-step process:

1. **Identifying climate-related support**, **i.e., support contributing to mitigation, adaptation, or cross-cutting objectives.** The adjusted version of the OECD Development Assistance Committee (DAC) Rio Markers Indicative Tables (2024)[70] can be used to assess which types of projects qualify as climate-related support. These Indicative Tables include criteria that determine how sectoral and sub-sectoral activities contribute to climate change mitigation, adaptation, or cross-cutting objectives.

2. **Including information to the Common Tabular Forms (CTFs).** Information on climate-related support was provided according to the CTFs.

2.4 Identification of relevant information on climate-related support received

Information on support received is compiled from relevant national administrative sources, sectoral institutions, project records and provider documentation.

When identifying the climate-related support received, all types of assistance was considered, including grants and technical assistance, as well as support provided through other financial instruments such as concessional loans, non-concessional loans, equity, guarantees, and insurance.

The identification process follows two complementary approaches depending on the source and characteristics of the activity.

First, support provided through dedicated climate funds and facilities whose mandate is explicitly focused on climate mitigation or adaptation—including, for example, the Green Climate Fund, Adaptation Fund and Mitigation Action Facility—is generally considered climate-related on the basis

[70] For more info: https://web-archive.oecd.org/temp/2024-06-04/315401-climate-change.htm

of the fund mandate and project objective. The specific project, financial amount, financial status, implementation period and other CTF parameters are nevertheless verified before reporting.

Second, projects and programmes provided through broader bilateral, multilateral or other financing channels are subject to activity-level climate-relevance screening. For methodological continuity with BTR1, the adjusted OECD DAC Rio Marker Indicative Tables provide an initial screening reference[71].

The indicative tables are used as guidance rather than as an automatic or exhaustive "positive list". A match with a listed sector or activity identifies a potential climate-related intervention but does not, by itself, demonstrate that the full project amount constitutes climate-specific support. The project's objectives, components and available supporting documentation are also assessed.

For adaptation-related activities, the assessment considers, where sufficient information is available, the climate-risk or vulnerability context, the stated intention to address the identified risk and the direct relationship between the intervention and the identified climate impacts. This is consistent with the activity-level approach reflected in the OECD guidance[72].

Following the adoption of the National Green Taxonomy[73] in 2026, the Taxonomy provides an additional national reference for identifying environmentally sustainable economic activities. It is used as a complementary classification framework and is not treated as automatically equivalent to the mitigation, adaptation or cross-cutting classification applied for ETF reporting. Further methodological alignment between the Taxonomy and the FTC reporting framework can progressively strengthen national climate-finance classification.

2.5. Classification, CTF allocation and avoidance of double counting

Once climate relevance has been established, the activity is classified according to the reporting parameters applicable to the relevant CTF. Depending on the type of support, these may include:

- source and channel of support;
- status of financial support;
- financial instrument;
- mitigation, adaptation or cross-cutting classification;
- sector and subsector;
- implementation status;
- contribution to technology development and transfer and/or capacity-building; and
- use, impact and estimated results.

Financial support, technology development and transfer, and capacity-building are not treated as necessarily mutually exclusive dimensions of an intervention. A financial project may, for example, finance technology deployment while also providing institutional or technical capacity-building.

Where the same intervention has several support dimensions, its monetary value is recorded once as a financial flow. Technology development and transfer and capacity-building dimensions may also be identified in the relevant CTFs, where appropriate, but are not treated as additional financial flows. This approach allows the substantive dimensions of support to be reflected while reducing the risk of monetary double counting.

The same principle applies to transparency-related support. Where an Article 13 project also builds institutional or technical capacity, its transparency-related contribution is separately identified without counting the underlying financial flow more than once.

Underlying national records may retain more detailed financial-status information—for example, approval, commitment, transfer, disbursement or expenditure—where such information is available. For CTF reporting, these records are mapped to the applicable reporting parameters, including the

[71] https://one.oecd.org/document/DCD/DAC%282024%2940/ADD2/FINAL/en/pdf

[72] See above

[73] https://e-qanun.az/framework/61767

financial-support status of “committed” or “received” and the activity status of “planned”, “ongoing” or “completed”.

Information is reconciled, where possible, across recipient records, project documentation and provider information in order to improve consistency, identify potential duplication and strengthen the traceability of reported support.

Identification process for climate-related support received

Figure 67 illustrates the steps that were followed by data providers for identifying climate-related projects and elements by central executive authorities and state-owned legal entities. The steps are the same for different types of support (e.g., financial support, technology development and transfer, and capacity-building support). However, the focus primarily was on identifying climate-related financial support, as the majority of international support for climate action is provided by donors through financial instruments.

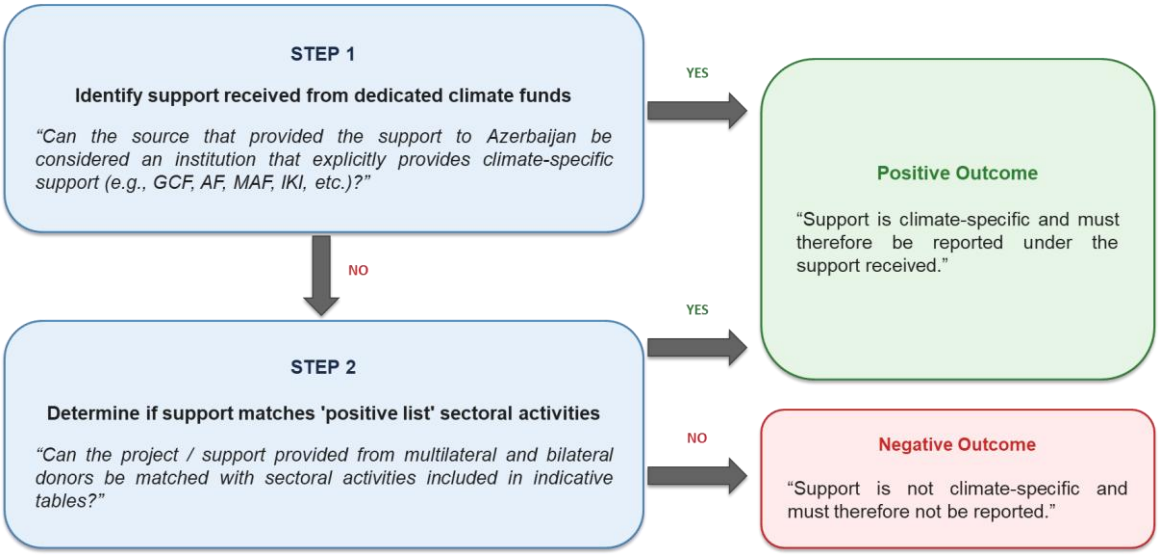


Figure 67. Decision tree for identifying the climate-specific support received

The following steps were followed to determine whether the projects were climate-related:

1. **Identification of the support received from dedicated climate funds**

Information on potentially relevant support is identified through sources including:

- dedicated climate funds and facilities;
- the national Grant Registry and other national administrative records;
- bilateral and multilateral cooperation;
- sovereign and state-guaranteed financing;
- sectoral and project-level records; and
- information provided by development partners and other providers.

The consolidated data on international support received was screened and the sources that provide climate-specific funding and assistance (Green Climate Fund (GCF), the Adaptation Fund (AF), the NAMA / Mitigation Action Facility (MAF), the International Climate Initiative (IKI), etc.) were identified.

2. **Determination if the support matches sectoral activities included in the ‘positive list’**

The Adjusted Indicative Tables were used to determine the climate-related support received from various bilateral and multilateral sources. These indicative tables present a ‘positive list’ of sectoral and sub-sectoral activities that contribute to climate change mitigation, adaptation and cross-cutting objectives.

3. Filling the CTFs on support received

After the climate-specific support received by Azerbaijan has been identified, the data transferred into the established reporting format, which is operationalized through the CTFs. Once climate relevance has been confirmed, the information necessary for reporting is verified, including, as applicable, the financial amount, instrument, status, implementation period, recipient, implementing entity and relevant support dimensions.

Figure 68 presents practical guidance that was used on determining the correct CTF for reporting data on support received. The data providing agencies followed this guidance to ensure that double counting of support received and overreporting is avoided.

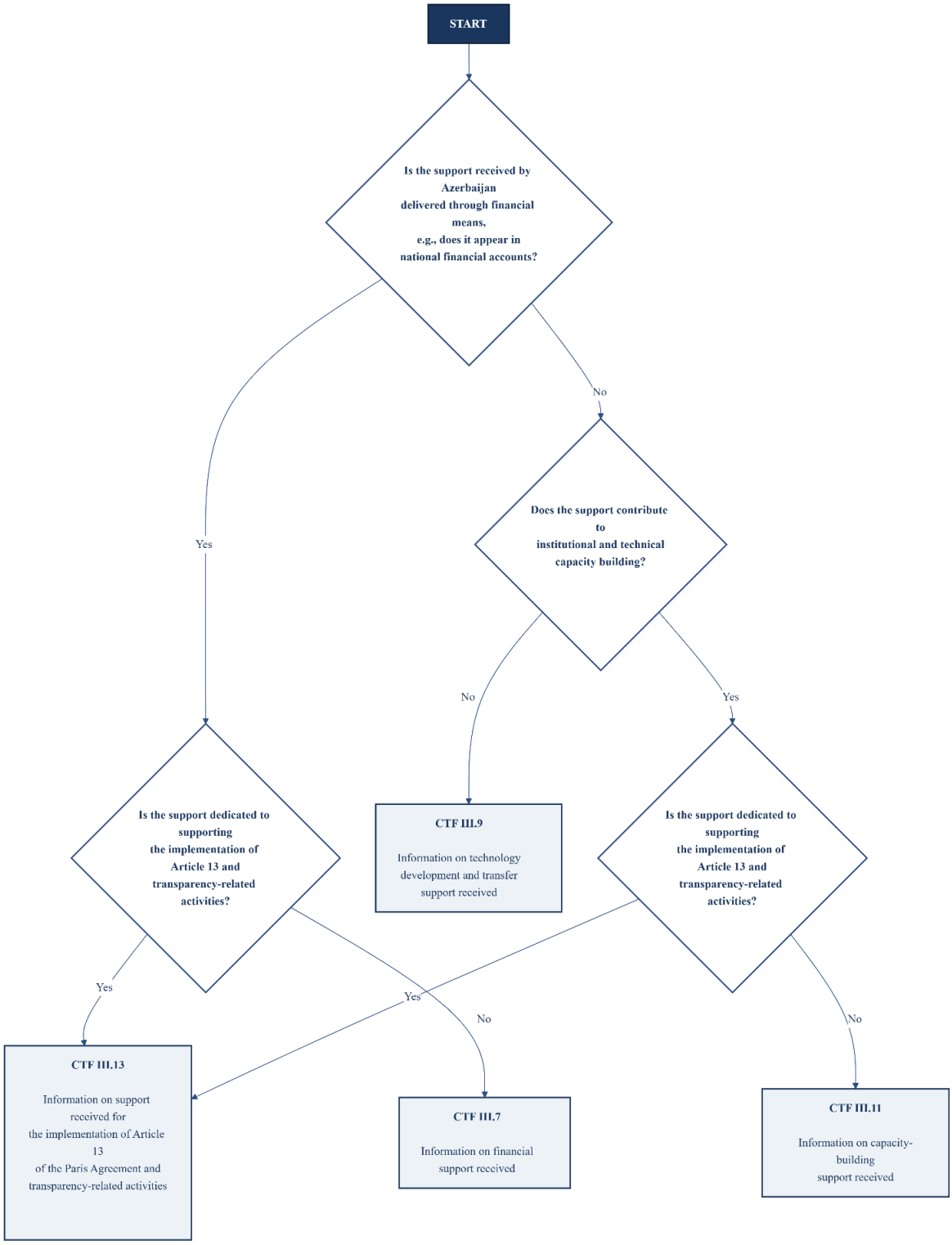


Figure 68. Decision tree for reporting the data on climate-specific support received in the CTF

The decision tree applies the following logic:

- support specifically related to implementation of Article 13 and transparency-related activities is reported under CTF III.13;

- other support delivered through a financial flow is reported under CTF III.7, with its contribution to technology development and transfer and/or capacity-building identified in the corresponding fields where applicable;
- non-financial technology development and transfer support is reported under CTF III.9; and
- non-financial capacity-building support is reported under CTF III.11.

This approach enables the principal form of support to be reported while retaining information on additional dimensions and minimizing the risk of double counting.

Identification of relevant information on climate-related support needed

The responsibility of identifying the climate-specific support needed and providing respective data lies with the line ministries that are engaged in sectoral climate change planning (e.g., MENR, Ministries of Agriculture, Digital Development and Transport, Energy, etc.). MENR coordinates the compilation and consolidation of the information for BTR reporting. Support needs are identified primarily through country-driven climate priorities, including NDC 3.0, the Initial National Adaptation Plan, the Technology Needs Assessment process and relevant sectoral strategies, programmes and plans.

The following steps describe how climate-related support needs were assessed. The steps are similar to those for identifying climate-related support received and are the same for various types of support (e.g., financial support, technology development and transfer support, and capacity-building support).

1. **Determining if the support needed matches with the sectoral activities included in the 'positive list'**

The relevant central executive authorities and state-owned legal entities assessed the support needs based on the Adjusted Indicative Tables to determine whether this information should be included in the report.

The climate relevance of the identified need is assessed on the basis of the underlying policy objective and climate rationale. The adjusted OECD DAC Rio Marker Indicative Tables may be used as a supporting reference, but a sectoral match alone is not considered sufficient to establish a support need.

For adaptation-related needs, the assessment considers, where possible, the relationship between the proposed intervention and identified climate risks, vulnerabilities or resilience objectives.

2. **Determination the scope of support needed**

The nature of the requirement is identified as:

- financial support;
- technology development and transfer support;
- capacity-building support; or
- support for implementation of Article 13 and transparency-related activities.

A single activity may require more than one form of support. For example, deployment of a priority technology may require both financial resources and specialized technical capacity. Where the principal requirement is financial, the corresponding technology development and transfer and/or capacity-building dimensions are identified alongside the financial need.

The support needed relates to the gap between the required resources and the sum of domestically available resources (e.g., public resources) and additional resources that are expected to be received from other sources (e.g., private sector or international donors, based on existing commitments).

Support needed = total resource requirements (financial costs / technology needs / capacity needs) – available resources (public resources, private sector or international donors, based on existing commitments)

Only resources associated with the same activity, programme or investment requirement are taken into account in determining the residual financing gap.

Where a reliable monetary estimate is not available, particularly for technology development and transfer or capacity-building needs, the requirement may be reported qualitatively rather than assigned an unsupported financial value.

3. Filling the CTFs on support needed

After the climate-specific support needed by Azerbaijan has been identified, the data transferred into the established reporting format, which is operationalized through the CTFs.

Figure 69 presents practical guidance that was used on determining the correct CTF for reporting data on support needed.

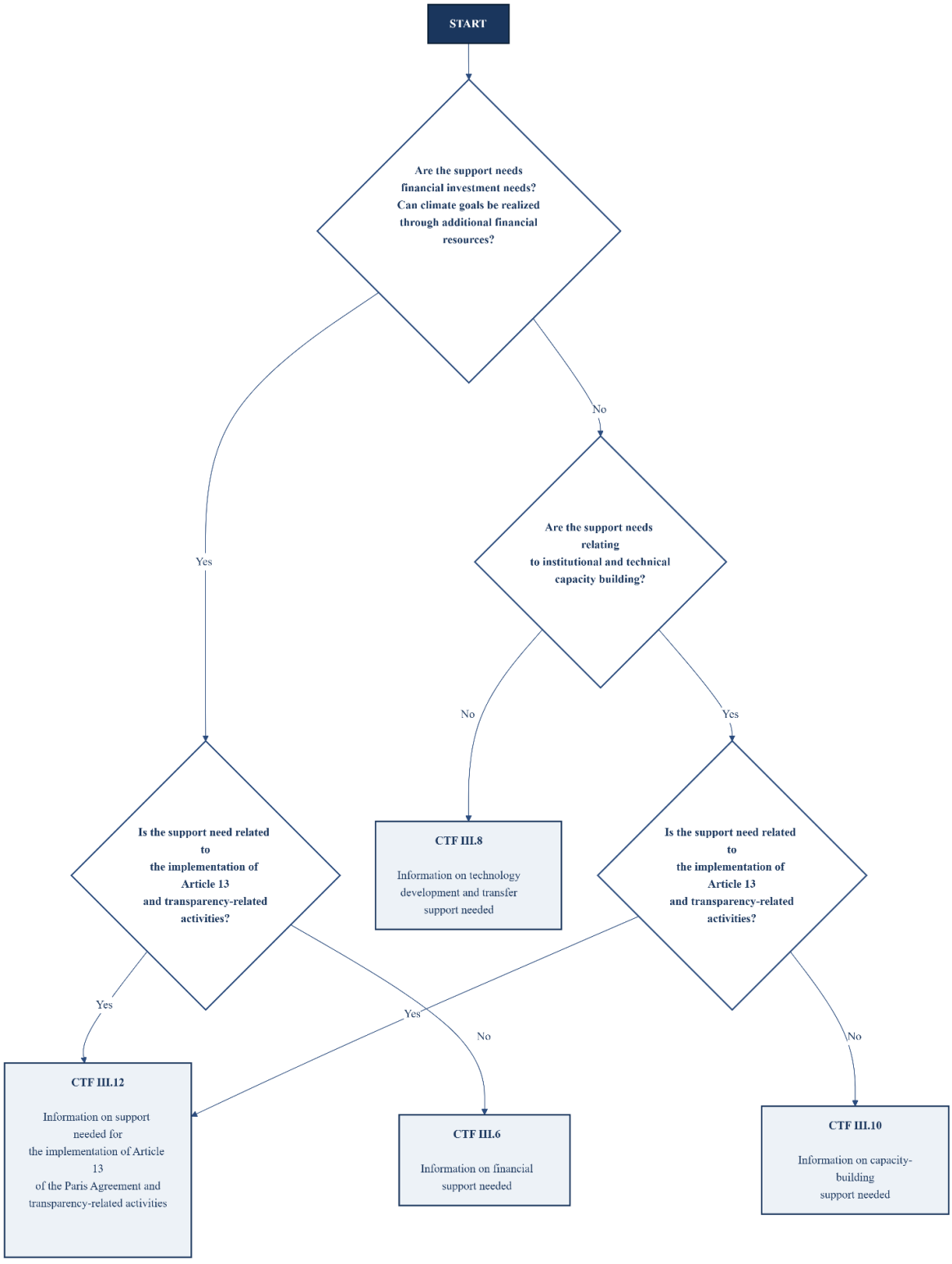


Figure 69. Decision tree for reporting the data on climate- specific support needed in the correct CTF

The decision tree applies the following logic:

- support needed specifically for implementation of Article 13 and transparency-related activities is reported under CTF III.12;

- other financial support needed is reported under CTF III.6, with its contribution to technology development and transfer and/or capacity-building identified where applicable;
- technology development and transfer support needed is reported under CTF III.8; and
- capacity-building support needed is reported under CTF III.10.

This methodology provides a consistent basis for identifying, classifying and reporting support needed and received while maintaining traceability to national priorities and reducing the risk of duplication across the CTFs.

Annex 1

List of abbreviations

ADB	-	Asian Development Bank
AFOLU	-	Agriculture, Forestry and Other Land Use
BAU		Business As Usual scenario
BTR		Biennial Transparency Report
BUR		Biennial Update Report
CCA	-	C
CRT	-	Common reporting tables
CO_2 eq	-	Carbon Dioxide Equivalent
CCA	-	Climate Change Adaptation
CDM	-	Clean Development Mechanism
ETF	-	Enhanced Transparency Framework
EF	-	Emission factor
F-gases	-	Fluoridated Gases
FNC	-	Fourth National Communications
FOD	-	First Order Decay
FTZ	-	Free Trade Zone
GoA	-	Government of Azerbaijan
GHG	-	Greenhouse gas
GEF	-	Global Environment Fund
GCF	-	Green Climate Fund
GWP		Global Warming Potential
GDP	-	Gross Domestic Product
HFCs	-	Hydrofluorocarbons
HWP	-	harvested wood products
İPCC	-	Intergovernmental Panel on Climate Change
IPPU	-	Industrial Processes and Product Use
LULUCF	-	Land Use, Land-Use change and Forestry
LCDS	-	Low-carbon development strategy
LDAR	-	Leakage Detection and Repair
MENR	-	Ministry of Ecology and Natural Resources
MRV	-	Measurement, Reporting and Verification
MPG	-	Modalities, procedures and guidelines
MCF	-	methane correction factor
MES	-	Ministry of Emergency Situations
MoE	-	Ministry of Economy
MoF	-	Ministry of Finance
MoA	-	Ministry of Agriculture

MSW	-	Municipal Solid Waste
MW	-	Megawatt
NIR	-	National Inventory Report
NDA	-	National Designated Authority
NAMA	-	Nationally Appropriate Mitigation Actions
NIR	-	National Inventory Report
NDC	-	Nationally Determined Contributions
NID	-	National Inventory Document
NIIP	-	National Inventory Improvement Plan
NC	-	National Communication
NA	-	not applicable
NE	-	not estimated
NO	-	not occur
N_2O	-	Nitrous Oxide
NAP	-	National Adaptation Plan
PFCs	-	Perfluorocarbons
QA/QC	-	Quality Control/Quality Assurance
RA	-	Reference approach
SGC	-	Southern Gas Corridor
SDRM	-	The Strategic Development Road Maps
SA	-	Sectoral approach
SSPI	-	The State Service on Property Issues
SOC	-	Soil organic carbon stock
SSC	-	State Statistics Committee
SF_6	-	Sulphur Hexafluoride
SOCAR	-	State Oil Company of Azerbaijan Republic
SWRA	-	State Water Resources Agency
TACCC	-	Transparency, accuracy, consistency, comparability, completeness
UNFCCC	-	UN Framework Convention on Climate Change
UNEP	-	UN Environment Programme
WMO	-	World Meteorological Organization
WUA	-	Water User's Associations

Annex 2

LIST OF TABLES

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