




KINGDOM OF SAUDI ARABIA

Second Nationally Determined Contribution



2025 SUBMISSION TO UNFCCC



The Kingdom of Saudi Arabia is pleased to submit its Second Nationally Determined Contribution (NDC) to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC). Following on from the previously submitted NDC in 2021, this document takes into account provisions and principles of the UNFCCC and its Paris Agreement in line with national circumstances, pathways, and approaches, including:

- a. Decisions 1/CP.21, 1/CP.24, 4/CMA.1, and 6/CMA.3,
- b. Article 3 of UNFCCC,
- c. Economic Diversification Initiative (as per decision 24/CP.18, Doha 2012),
- d. Paris Agreement Articles 2.2, 3, 4.1, 4.3, 4.7, 4.15, 7, 10, 11, 13, and 14.

The Kingdom is pursuing plans and efforts to diversify its economy through its Circular Carbon Economy (CCE) approach to meet its sustainable development goals, which will result in co-benefits, including greenhouse gas emission avoidance, reduction, and removal, as well as climate impact adaptation and management of the impacts of response measures.

The Kingdom contributes to the objective of the UNFCCC and the goals of its Paris Agreement, taking into consideration the challenges associated with its national circumstances (i.e., desertification, water scarcity, sandstorms, etc.) as a developing country while increasing long-term national benefits and reducing the possible adverse impacts, as reflected throughout this NDC.

INTRODUCTION

The Kingdom of Saudi Arabia continues to advance its efforts towards the objective of the UNFCCC and the goals of its Paris Agreement, pursuing sustainable development through three main pillars: contributions to economic diversification with mitigation co-benefits, contributions to adaptation with mitigation co-benefits, and stand-alone adaptation initiatives. Within these pillars, a wide range of policies, programs, projects, plans, and initiatives are outlined in this submission. Collectively, they aim to reduce, avoid, and remove greenhouse gas (GHG) emissions by 335 million tons of CO₂eq annually reached by 2040, expressed through GHG and non-GHG metrics, on the basis of a dynamic baseline, with the year 2019 designated as the base year for this NDC. This submission represents a progression of 20.5% from the updated first NDC, noting that NDC1 itself reflected approximately an increase of 114% in ambition compared to the INDC. This ambition is in line with the Kingdom's national efforts and pathways for climate action, sustainable development, and net-zero ambitions.

The ambitions outlined in this NDC are contingent on sustained economic growth and diversification, supported by a robust contribution from hydrocarbon export revenues to the national economy. Through planned and ongoing actions, the Kingdom is making tangible progress across multiple sectors, driven in large part by the fruitful outcomes of its Vision 2030. This new ambition builds on the aforementioned foundations and achievements, as well as the Circular Carbon Economy (CCE) approach, endorsed by G20 leaders in 2020 as a holistic, integrated, inclusive, and pragmatic approach to managing emissions. The CCE approach aims to provide new pathways towards economic growth that can be applied, reflecting countries' priorities and circumstances.

Through these actions, the Kingdom has embarked on a comprehensive and ambitious set of measures to realize its climate ambitions. It also rests on the assumption that the economic and social consequences of international climate change policies and measures will not pose a disproportionate or abnormal burden on the Kingdom's economy (Paragraph 2 of Article 3 of the UNFCCC).

The Kingdom, through the CCE approach, continues to implement integrated policies, programs, projects, plans, and initiatives across vital sectors, reflecting a balanced approach that takes into full consideration its national circumstances, which span multiple dimensions i.e., desertification, water scarcity, and population growth, and interlinks it with sustainable development. Examples of such national initiatives and programs are the Saudi Green Initiative, the Renewable Energy Program, and the Saudi Energy Efficiency Program. The Kingdom is also a member and active participant in major international platforms, such as the Global Methane Initiative, Mission Innovation, and the Clean Energy Ministerial.

1. NATIONAL CIRCUMSTANCES

Saudi Arabia is characterized by an arid environment with an ecosystem that is particularly vulnerable to climate change. Its climatic, topographic, and geographic characteristics present several challenges, including extremely high summer temperatures, very low annual rainfall, predominantly non-arable land, and a heavy reliance on deep confined groundwater resources. The Kingdom is also vulnerable to desertification, as it poses a significant challenge to the climate in the Kingdom, impacting agriculture and biodiversity, and is a critical concern in a country where over 80% of the land is desert and a dry hot climate prevails.

All these conditions exacerbate water scarcity as one of the Kingdom's most pressing concerns. The Kingdom also faces the unique circumstances of the Hajj Pilgrimage and Umrah, which brings millions of travelers to Mecca each year from around the world, placing pressure on logistics, public health systems, and essential resources. Additionally, Saudi Arabia has experienced rapid population growth, and with 63% of its population under the age of 30, that results in a significant demand for education, employment, housing, and public services.

The Kingdom's reliance on primary resources has made its economy vulnerable to global market fluctuations. In response, the Kingdom has launched multiple holistic national initiatives, including Vision 2030 and the Saudi Green Initiative, which place economic diversification as a cornerstone of the Kingdom's sustainable development strategies driving long-term economic growth, improving overall quality of life, and reducing reliance on primary resources by expanding the share of sectors such as manufacturing, energy and its derivatives, tourism, entertainment, logistics, and technology in the domestic income streams to sustain the national economy.

2. NDC AMBITION

The Kingdom aims to reduce, remove, and avoid GHG emissions by 335 million tons of CO₂eq annually to be reached by 2040, expressed through a combination of GHG and non-GHG metrics. Non-GHG metrics include an ambition of, inter alia, expanding renewable energy capacity, complemented by ongoing and planned afforestation, land restoration, and land rehabilitation initiatives of approximately 4 million hectares of land to combat desertification. The year 2019 has been designated as the base year for the NDC. This submission represents a progression of 20.5% from the updated first NDC, noting that NDC1 itself reflected approximately an increase of 114% in ambition compared to the INDC. This ambition represents progression and the highest possible ambition, in line with the Kingdom's national efforts and pathways for climate action, sustainable development, and net-zero ambitions.

The aim of this NDC is to implement measures that accelerate economic diversification, as outlined in Section 4 below (Scenario 1). The new ambition is also premised on the assumption that the economic and social consequences of international climate change

policies and measures will not pose a disproportionate or abnormal burden on the Kingdom's economy (Paragraph 2 of Article 3 of the UNFCCC).

3. AMBITION AND FAIRNESS

Considering its unique national circumstances, limited-resource economy, and historically low GHG emission contribution, the Kingdom regards its 2040 ambition as fair and reflective of the highest possible ambition, and the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC), in light of different national circumstances, as the sum of the contributions leads to a significant deviation from a business-as-usual emission scenario.

This NDC represents both progression and the highest possible ambition, while identifying the dynamic baselines to account for the Kingdom's national context and the changing global landscape. For ambition and fairness, nationally determined pathways shall be respected, and no barriers should be imposed to undermine the agreed principles of just transitions, thus safeguarding the nationally determined nature of the NDC and ensuring that climate resilient development is assessed based on emission reductions and not targeting resources. Additionally, through initiatives such as the Middle East Green Initiative, Saudi Arabia also advances mitigation and adaptation beyond its national boundaries.

However, the implementation of the Kingdom's NDC could face barriers arising from climate change related trade-restrictive unilateral measures and cross-border directives that introduce and actively impose externally defined criteria while disregarding diverse national contexts. These include the Carbon Border Adjustment Mechanisms (CBAM), as well as related cross-border corporate and regulatory frameworks, such as the Corporate Sustainability Due Diligence Directive (CSDDD), which may interfere with the implementation of climate action efforts designed in line with national circumstances and sustainable development priorities. These unilateral trade measures distort investment signals and affect the competitiveness and continuity of mitigation activities. These impacts collectively create barriers to achieve the Kingdom's NDC while pursuing economic diversification and climate ambitions in accordance with national priorities.

4. DYNAMIC BASELINES

Two scenarios for determining dynamic baselines for the period 2030-2040:

Scenario 1: Economic diversification with a robust contribution based on income from hydrocarbon and its derivatives' export revenues. Export revenues are channelled into investments in high-value-added sectors such as financial services, medical services, tourism, education, material transition, renewable energy, and energy efficiency technologies to enhance economic growth. The ambitions and contributions outlined in this NDC are set under this scenario.

Scenario 2: Accelerated domestic industrialization based on sustainable utilization of hydrocarbons, while addressing emissions from greenhouse gases, as appropriate. A heavy industrial base is built to use domestic hydrocarbon resources as feedstock or energy source, abated with the best suitable technologies, increasing contributions of petrochemical, cement, mining, and metal production industries to the national economy, including carrying out a material transition that substitutes conventional materials with reliable and sustainable polymer-based materials.

The allocation of hydrocarbons produced for either export or domestic use is the primary distinction between the two baseline scenarios. Domestic use of hydrocarbons will raise Saudi Arabia's GHG emissions, while exported hydrocarbons will not contribute to the increase of GHG emissions. The baseline for the ex-ante estimations is established using combinations of the two scenarios that are weighed differently.

5. COMPREHENSIVE APPROACHES TO THE NDC

The approaches outlined hereafter are grounded in Scenario 1 of the dynamic baseline, which takes into account national income and the trajectory of economic progress. The Kingdom is advancing in its contributions to the objective of the UNFCCC and the goals of its Paris Agreement, structuring its efforts around three key pillars **'contributions to economic diversification with mitigation co-benefits'** as well as **'contributions to adaptation'** which comprises of both **'adaptation measures with mitigation co-benefits'** and **'stand-alone adaptation'**. The first pillar underscores the Kingdom's efforts to ensure economic prosperity and sustainable development. Adaptation with mitigation co-benefits represents measures that strengthen resilience to climate impacts while simultaneously generating additional emission-reduction benefits. Stand-alone adaptation, by contrast, is directed solely at building resilience and safeguarding ecosystems and resources to support long-term prosperity.

5.1. Contribution to Economic Diversification with Mitigation Co-Benefits

The Kingdom, through the Circular Carbon Economy (CCE) approach, is pursuing economic diversification with mitigation co-benefits as a systemic transformation that shifts from an economy primarily dependent on limited sources of income to a more diversified economy, drawing from a broad array of sectors as indicated in the Kingdom's Vision 2030. These endeavors reflect a portfolio of projects seeking to improve energy efficiency, scale up renewable energy, advance carbon capture, utilization, and storage (CCUS), promote clean hydrogen, modernize thermal generation, and expand natural gas systems, pursue lower carbon aviation fuel (LCAF), and strengthen methane management frameworks.

5.1.1. Energy Efficiency

The Kingdom continues to advance a comprehensive portfolio of initiatives aimed at improving energy efficiency across both supply and demand sectors. The Saudi Energy Efficiency Center (SEEC) oversees the Saudi Energy Efficiency Program (SEEP) and leads the

implementation of these efforts in the utilities, industry, buildings, and transport sectors. SEEC's initiatives include improving the efficiency of home appliances and air conditioning units, optimizing energy and feedstock utilization in key industrial sub-sectors such as petrochemicals, enhancing the fuel economy of transport fleets, increasing the efficiency of power generation, water desalination, and electricity transmission and distribution, as well as leveraging technology and promoting widespread adoption of smart systems for energy optimization.

To ensure the effectiveness of these initiatives, the Kingdom has established enabling measures such as robust monitoring and compliance frameworks, incentive mechanisms, public awareness campaigns, capacity-building programs, and the development of energy services companies (ESCOs) market in the Kingdom. In parallel, the National Energy Services Company (Tarshid) was established to stimulate private sector investment in energy efficiency. Tarshid develops, manages, and implements large-scale retrofitting programs for street lighting and government buildings, in cooperation with relevant stakeholders, to rationalize energy consumption across all government assets in the Kingdom.

5.1.2. Renewable Energy

Renewable energy projects are an integral part of the Kingdom's strategy to diversify the energy mix used in electricity generation. To achieve this, the Kingdom is deploying various renewable electricity generation technologies, such as solar, wind and Battery Energy Storage Systems (BESS), while also exploring additional avenues for development, such as concentrated solar power, geothermal, pumped hydro-storage, and nuclear. As part of this effort, and under the National Renewable Energy Program, the Kingdom has tendered 57.5 GW of renewable energy capacity, of which 12.3 GW has been connected to the grid, 10.7 GW is under construction, 15.7 GW has already been commercially signed, and 18.8 GW is at different stages of development.

Building on its previous tendering activities, the Kingdom has taken steps to further enhance energy security and grid stability. As such, it has tendered 30 GWh, of which 8 GWh is already connected to the grid, and the remaining in various stages of development. Moreover, the National Geographical Survey Project was launched covering 850,000 KM to install solar and wind measurement stations where more than 500 stations have been installed so far. In fact, the Kingdom has repeatedly achieved the lowest cost in Levelized Cost of Electricity (LCOE) in both solar and wind projects at 1.04 UScents/kWh and 1.57 UScents/kWh for solar and wind projects respectively. Alongside capacity growth, the Kingdom plans to further localize a significant portion of the renewable energy value chain, spanning manufacturing, research, and development, while continuing to meet national renewable energy targets.

5.1.3. Carbon Capture Utilization & Storage (CCUS)

In Saudi Arabia, carbon capture, utilization, and storage (CCUS) technologies are deployed to reduce emissions from large-scale point-sources through conversion into value-added products or storage through various approaches, in geological reservoirs, carbon mineralization, and carbon sequestration. The Kingdom is developing large-scale CCUS hubs in the industrial cities of Jubail and Yanbu, wherein it is leveraging its experience in the CO₂ Enhanced Oil Recovery (EOR) project and its operation of the world's largest carbon capture and utilization facility.

Under the Circular Carbon Economy (CCE) approach, the Kingdom aims to advance large-scale deployment of CCUS and to contribute to national climate goals, with current CCUS projects in the Kingdom capturing 1.3 million tons annually. The Jubail CCS Hub is set to capture and sequester 9 million tons of CO₂ annually by 2028, with ongoing efforts to further expand its capturing and sequestering capacity. Similarly, Yanbu CCU Hub intends to advance utilization pathways, including the production of green methanol and low-carbon urea.

5.1.4. Efficient Thermal Energy and Natural Gas

The Kingdom continues its efforts to upgrade existing thermal power generation and deploy new highly efficient gas-combined cycle power plants with Carbon Capture and Storage (CCS) readiness. Saudi Arabia's sustainability ambitions involve growing gas capacity by tapping into new resources such as unconventional resources. Going forward, the Kingdom aims to enhance its reliance on highly efficient gas-fired power plants. Furthermore, the Kingdom is aligning its increased upstream gas production with midstream advancements by expanding the Master Gas System to meet the growing energy demands of emerging sectors and achieve a more balanced energy mix.

5.1.5. Lower Carbon Aviation Fuel (LCAF)

Lower Carbon Aviation Fuel (LCAF) will be implemented in the Kingdom through numerous actions such as energy-efficient refinery design, flare gas capture, control of venting, fugitive emissions monitoring, integration of renewable electricity, adoption of lower-carbon hydrogen, and large-scale carbon capture and storage, amongst other best practices, in order to lower the carbon intensity of jet fuel production. By implementing these activities, Saudi Arabia is delivering near-term and scalable GHG emissions reductions, accelerating the pathway for the sector's transition and positioning itself as a global leader for establishing a balanced and equitable pathway to ensure the aviation sector is sustainable. Pursuing these initiatives will also position the Kingdom to achieve emissions reduction in the aviation sector in a timely manner, in one of the most hard-to-abate sectors.

5.1.6. Clean Hydrogen

The Kingdom aims to become a key producer and exporter of clean hydrogen by leveraging its abundant low-cost renewable energy resources and natural gas, ample carbon sink capacity,

strategic location, and its long-standing experience as a global energy market leader. To meet its ambition, the Kingdom is building giga-scale clean hydrogen projects such as the NEOM hydrogen project and Yanbu Green Hydrogen Hub, while exploring the utilization of clean hydrogen to decarbonize hard-to-abate sectors. Pilot projects, research, and demonstrations are planned to be undertaken to improve technology maturity and lower costs for clean hydrogen and its derivatives.

5.1.7. Methane Management

Saudi Arabia is a global leader in methane emission management within the energy sector, recording one of the lowest upstream and methane intensities among major oil and gas producing countries. Since the 1970s, the Kingdom has progressively developed one of the most effective methane management frameworks worldwide by collecting the gas associated with oil production and developing of the Master Gas System (MGS). The Kingdom continued to expand the MGS afterwards, and the latest expansion poised to start operating in 2028 will further enable economic growth and enhance the Kingdom's energy mix. In parallel, other measures have been deployed including the elimination of routine flaring in the oil and gas industry to near-zero, the of the installation Flare Gas Recovery System (FGRS) to recover waste gas to be recycled for plant's own use, as well as the Leak Detection and Repair Program (LDAR) to spot leak points and repair them.

Building on this, Saudi Arabia continues to advance methane management efforts beyond the energy sector through ongoing and planned initiatives targeting methane emissions from wastewater, solid waste, and agriculture, including landfill diversion and improved waste management practices. The Kingdom also maintains active engagement in international methane initiatives, including the Global Methane Pledge, the Global Methane Initiative, and the Zero Routine Flaring commitment, reinforcing its leadership and comprehensive approach to methane management and mitigation.

5.2. CONTRIBUTIONS TO ADAPTATION

The Kingdom allocates significant resources and efforts to initiatives that preserve and restore its natural environment, strengthen climate resilience, and protect communities from climate risks. Diverse adaptation efforts are applied across multiple sectors, prioritizing inclusivity of all adaptation approaches, and alignment with national and local specific contexts. In this, it distinguishes between adaptation measures that include co-benefits from mitigation and those that are solely focused on adaptation and resilience enhancement.

5.2.1. Adaptation With Mitigation Co-Benefits

The following adaptation measures are anticipated to enhance resilience to climate impacts and provide mitigation co-benefits. These measures enable more efficient use of resources by addressing multiple climate goals through integrated approaches. Through these actions

that deliver both adaptation and mitigation outcomes, the Kingdom enhances its resilience, adaptive capacity and reduces long term vulnerability.

5.2.1.1. Water and Wastewater Management

The Kingdom's arid climate, high evaporation rates, limited rainfall, and scarce renewable water resources place strains on water and wastewater management. Around 70% of potable water comes from desalination. Ambitions for adaptation measures with mitigation co-benefits against this backdrop incorporate renewable energy-powered Reverse Osmosis (RO), Reverse Electrodialysis (RED), advanced leak detection and water losses minimization, brine concentration optimization and mining, sludge waste multiuse into value-added products, and smart monitoring systems.

Additional efforts focus on energy efficiency, Long-Term Operation and Maintenance (LTOM) contracts, expanding treated wastewater reuse for agriculture and urban greening, tertiary level wastewater treatment plants, constructed wetlands, surface water storage through dams, and modern irrigation methods such as sprinkler, surface, and drip systems. Long-term water plans include a 2050 Strategic Water Plan and a 2075 treated wastewater reuse and supply-demand strategy to interconnect regional systems, boost supply, cut wastage, and account for all users. These plans also strengthen polymeric materials for use in efficiency and support the National Cloud Seeding Program to increase rainfall.

5.2.1.2. Marine Protection

Marine protected areas and coastal management planning will play a central role in lowering coastal erosion, enhancing blue carbon sinks, and preserving associated ecosystems and biofilters. Efforts include planting mangrove seedlings, enhancing biological diversity across coastal zones within the Red Sea by 30% by 2040 through the restoration of coral reefs, mangroves, seagrass, native vegetation, and undertaking re-wilding of flora and fauna. The mangroves of Saudi Arabia are significant blue carbon ecosystems, sequestering and storing large volumes of carbon annually. These ambitions will be supported by expanded research and improved data on blue carbon mangrove ecosystems.

5.2.1.3. Afforestation and Land Restoration

The Kingdom's efforts to combat desertification and adapt to the impacts of climate change involve large-scale tree planting and ecological restoration efforts focused on land stabilization, increasing vegetation cover, resource conservation, and wildlife protection reserves. Future measures will prioritize using recycled irrigation water, rehabilitating arid and semi-arid regions, and establishing national nurseries, parks, and green belts to control/minimize sand movement around urban areas and roads. Efforts are complemented by a novel oxalotroph-based technology that combines reforestation and microbiomes to sequester carbon in arid soils for the long term. The 2040 National Biotechnology Strategy also supports this by breeding drought and heat-tolerant tree species that drive afforestation,

while advancing public health through stronger food self-sufficiency, sustainable farming practices, and improved nutrition from resilient biotech crops. In addition, the Kingdom is part of the G20 Global Land Initiative that was launched in 2020 at the G20 Summit, which collectively aims to prevent, halt, and reverse land degradation with an ambition to reduce degraded land by 50% by 2040.

5.2.1.4. Urban Planning

The Kingdom is advancing urban planning initiatives in areas such as mass transportation, mega-projects, and modern municipal services to improve the quality of life while reducing environmental impacts. For instance, municipal services include waste management transformation programs, and national campaigns to reduce food loss and waste. Efforts are also underway to phase out traditional landfills and replace them with engineered facilities that incorporate advanced waste management practices with nearly 100 traditional landfills closed since 2024. These actions are complemented by the National Waste Management Strategy, with an aim for completion in 2040. Additional efforts include sludge-to-fertilizer conversion, biogas production from sludge, resource conservation awareness campaigns, the segregation and diversion of hazardous and recyclable waste from landfills, enhanced food processing, and measures to diversify food sources.

5.2.2. Stand-Alone Adaptation

Efforts focused solely on adaptation aim to help the Kingdom address climate change and strengthen its resilience. These efforts are designed to enhance adaptive capacity in ways that support sustainable development, particularly through the protection of critical infrastructure, ecosystems, and livelihoods. In doing so, the Kingdom demonstrates its commitment to advancing the Global Goal on Adaptation and ensuring that resilience-building efforts reduce risks associated with different global warming scenarios and contribute to adequately adapting to the climate impacts in the context of the temperature goals of the Paris Agreement, through the following measures.

5.2.2.1. Early Warning Systems (EWS)

The Kingdom's early warning system is a mechanism deployed to deal with extreme weather events, including floods, rainstorms, and dust storms. It classifies alerts and issues warnings hours in advance, based on set criteria for each level. This mechanism complements efforts undertaken to strengthen national food and water security by ensuring sufficient supplies of essential commodities, expanding strategic storage infrastructure, maintaining reliable access to food in local markets, and safeguarding water resources.

5.2.2.2. Integrated Water Management Planning

Facing the critical challenge that water scarcity in the region poses to sustainable economic and social development, ambitions focus on measures that prioritize comprehensive risk

assessments, the establishment of clear allocation of priorities, the strengthening of licensing and regulatory frameworks, the deployment of digital platforms for oversight, and the monitoring of utility performance and compliance through real-time databases and remotely operated networks. For example, by 2040 the Kingdom aims to build an integrated aquifer recharge system in the south to capture and treat stormwater over 100 hectares, replenishing groundwater and reducing flood risks.

Building on the Kingdom's existing network of more than 500 operational dams, one initiative aims to expand the current capacity of 2.6 billion m³ to effectively increase national capacity to capture and store rainfall in dams for use as a critical buffer during periods of drought and prolonged dry spells. It will also curb flood risks, while enhancing groundwater recharge, securing reliable water supplies for agriculture and industry, and strengthening long-term resilience to climate change. All efforts are to be complemented by the Saudi Code for Water Resources, which establishes regional management zones and local Code Units that guide surface water harvesting, dam management, and flood control.

5.2.2.3. Infrastructure and Cities Designs

The Kingdom enhances urban and industrial infrastructure development while reducing climate vulnerabilities through a set of administrative and technical regulations governing building design and construction, including the Saudi Green Building Code, which promotes sustainable practices such as energy efficiency, designing for thermal comfort, water conservation, and waste reduction. Multiple flagship developments across the Kingdom's urban centers are positioned to pursue sustainable infrastructure and leadership in Energy and Environmental Design credentials.

5.2.2.3. Marine Conservation

The Kingdom is advancing towards its goal of expanding protected marine areas to cover 30% of its coastal marine zones. Towards this ambition, the Kingdom is restoring coral reefs across the northwest Arabian Gulf, while building stronger regional partnerships to develop mechanisms for the purpose of conserving the marine environments of the Red Sea and the Gulf of Aden while enhancing contingency planning against marine pollution. With these measures, conservation sites, such as the Ras Baridi sea turtle rookery north of Yanbu, will restore nesting beaches and map critical habitats using mark-recapture, aerial surveys, and satellite tagging to support species conservation.

6. RESPONSE MEASURES

The Kingdom has adopted a comprehensive approach in assessing climate vulnerabilities, risks, and socio-economic impacts, particularly related to adverse impacts of climate change response measures. Aligned with its strategic development plans and its Vision 2030, the Kingdom has launched a range of policies, programs, projects, plans, and initiatives aimed at addressing potential social and economic losses triggered by climate change response

measures that could affect the progress of the Kingdom's economic diversification and adaptation initiatives.

In this context, to raise the Kingdom's resilience to measures taken by other parties, response measures are considered essential to maintaining the Kingdom's sustainable development trajectory while delivering on its NDC. Previous efforts have focused on understanding the economic impacts of global mitigation policies, advancing technological innovation, fostering international technology cooperation, and supporting long-term energy market stability. Through these, the Kingdom has been able to engage in the following areas:

- i. **Economic Growth and Job Creation**, such as initiatives in trade and transport, real estate development, sports, and entertainment.
- ii. **Human Capital Development**, such as investments in healthcare and education.
- iii. **Community Development**, such as projects in tourism, urban development, and information & communication technology (ICT).

7. NDC TIMEFRAME

The ambition outlined in this NDC applies to the period from 2030 to 2040.

8. MEANS OF IMPLEMENTATION

The Kingdom's NDC requires the attraction of resources, investments, expertise, and partnerships across key enablers. These enablers will provide the guidance and support necessary to sustain effective implementation. However, the implementation of this NDC is not contingent on receiving international financial support.

8.1. Initiatives and Programs

8.1.1. Saudi Green Initiative

The Saudi Green Initiative is a national initiative that engages all sectors of society to deliver on three primary objectives: emissions reduction, afforestation, and land and sea protection. Its initiatives span various thematic areas, such as education, clean energy, and planting trees, among others.

8.2. Finance

The implementation of this NDC is not contingent on receiving international financial support.

This NDC will be enabled by investments, including international investments, across solutions and technologies the Kingdom requires to implement its national pathways. The Kingdom has pursued efforts to attract such investments in the context of its efforts to respond to Article 2, paragraph 1(c), of the Paris Agreement in a nationally determined manner that is appropriate to its national circumstances. The Kingdom will be building on recent efforts, which include the first-ever sovereign Green Bond issuance by the Kingdom which was issued

in line with the Saudi Green Finance Framework designed to contribute to the achievement of the Kingdom's NDC and achieve its climate priorities through the Circular Carbon Economy approach. Through Vision 2030 and the Saudi Green Initiative, the Kingdom engages with private sector entities and other stakeholders via partnerships that aim to contribute to the Kingdom's nationally determined pathway centred on economic diversification and sustainable development.

8.3 TECHNOLOGY

The Kingdom's agnostic approach to technological advancements is key to achieving its NDC ambitions. Deployments and developments of technologies such as CCUS and Direct Air Capture (DAC) have been advancing within the national landscape, highlighted by the launch of the DAC pilot by King Abdullah Petroleum Studies & Research Centre (KAPSARC).

The ongoing investment, international cooperation, and technology transfer surrounding these technologies underscore their significant role in realizing national sustainability objectives. This is reflected in the Kingdom's efforts at both the national and international levels, as demonstrated through its engagements in high-level platforms such as Mission Innovation, the Global Methane Pledge, and the Clean Energy Ministerial.

8.4. Article 6 Voluntary Cooperation, Approaches, and Mechanism

The Kingdom of Saudi Arabia considers voluntary cooperation and approaches referred to in Article 6.2 as well as the mechanism referred to in Article 6.4 of the Paris Agreement as essential for international climate goals. Once these are fully operational and utilized, such cooperation, approaches, and mechanisms including internationally transferred mitigation outcomes (ITMOs), may play a role in achieving the Kingdom's NDC ambitions. They will enhance private sector engagement, advance innovation in business models, unlock investment flows and support cleaner energy technology development. Therefore, the Kingdom reaffirms its commitment to, and alignment with, the Article 6 rulebook under the Paris Agreement, and continues to closely follow the developments related to its implementation and its consideration to engage in both GHG and non-GHG metrics.

8.5. Capacity Building

The Kingdom is adopting a holistic approach to building national capacity, considering its predominantly young population and its continued commitment to increasing women's participation in the workforce, with women representing more than 36% of the labor force and 55% of higher education graduates as of 2024, surpassing the Vision 2030 target seven years ahead of schedule. It also accounts for the evolving nature of both emerging and established sectors, in line with the national economic diversification and sustainable development plans. Ensuring comprehensive coverage of these national plans, while strengthening capacity-building, promoting equity, and expanding access to employment opportunities, is therefore essential. Since its launch in 2021, the Human Capability Program

has evolved to capture economic and social aspects. Achieving the ambitions of this NDC depends on sustained efforts to strengthen skills at both the individual and systemic levels.

9. MONITORING AND REPORTING ON NDC IMPLEMENTATION

The Designated National Authority (DNA), established by the Kingdom as a robust and functional institutional arrangement, governed by a committee that is composed of a diverse group of representatives from government, semi-government, and private sector entities, ensures a comprehensive perspective on more than 90% of national GHG emissions. The DNA serves as the focal point for the preparation of the instituted reporting requirements under the UNFCCC and its Paris Agreement and is responsible for overseeing, coordinating, and tracking progress towards the Kingdom's NDCs.

Established and managed by the DNA, the national MRV system is an integral part of the existing and future monitoring and reporting. The national MRV system has provided essential input into the development of the NDC and is also crucial for tracking progress towards achieving NDC projects and plans, as well as any subsequent updates. Furthermore, the DNA serves as the focal point for Article 6 implementation, with responsibilities encompassing the regulation of carbon management activities, the issuance of credits, and the approval of emission reduction projects.

TABLE 1: INFORMATION NECESSARY FOR CLARITY, TRANSPARENCY, AND UNDERSTANDING (ICTU)

1. Quantifiable information on the reference point (including, as appropriate, a base year):		
a	Reference year(s), base year(s), reference period(s) or other starting point(s);	The Kingdom's NDC designated 2019 as the base year and is based on scenario 1 of the dynamic baseline.
b	Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year;	The Kingdom's greenhouse gas emissions inventory was referenced for the year 2019 in the Kingdom's BTR1.
c	For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties to provide other relevant information;	Not applicable
d	Target relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction;	Aims to reduce, avoid, and remove greenhouse gas (GHG) emissions by 335 million tons of CO ₂ eq annually reached by 2040, expressed through GHG and non-GHG metrics, on the basis of a dynamic baseline, with the year 2019 designated as the base year for this NDC. For further details refer to "Section 2. NDC Ambition".
e	Information on sources of data used in quantifying the reference point(s);	The reference point was quantified using national GHG inventories from the relevant sectors.
f	Information on the circumstances under which the Party may update	Values of the reference indicators may be recalculated to reflect new data and

	the values of the reference indicators.	methodological improvements in GHG inventory estimations or in response to developments.
2. Time frames and/or periods for implementation:		
a	Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA);	2030-2040
b	Whether it is a single-year or multi-year target, as applicable.	The Kingdom aims at reducing, avoiding, and removing GHG emissions by 335 million tons of CO ₂ eq annually reached by 2040.
3. Scope and coverage:		
a	General description of the target;	<p>A wide range of policies, programs, projects, plans, and initiatives are outlined in this submission. Collectively, they aim to reduce, avoid, and remove greenhouse gas emissions by 335 million tons of CO₂eq annually reached by 2040, expressed through GHG and non-GHG metrics, on the basis of a dynamic baseline, with the year 2019 designated as the base year for this NDC.</p> <p>The Kingdom of Saudi Arabia continues to advance in its efforts towards achieving the objective of the UNFCCC and the goals of its Paris Agreement, pursuing sustainable development through three main pillars: contributions to economic diversification with mitigation co-benefits, contributions to adaptation with mitigation co-benefits, and stand-alone adaptation initiatives.</p>
b	Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable,	In line with the 2006 IPCC Guidelines, sectors covered include those under Energy, IPPU, Agriculture, LULUCF, and Waste. The GHGs

	consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines;	addressed currently comprise of the three main gases CO ₂ , CH ₄ , and N ₂ O.
c	How the Party has taken into consideration paragraph 31(c) and (d) of decision 1/CP.21;	All categories of anthropogenic emissions or removals are included. Additionally, no source, sink, or activity that was included in the previous version of the NDC has been excluded.
d	Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans	Refer to "Section 5. Comprehensive Approaches to the NDC".

4. Planning processes:

a	Information on the planning processes that the Party undertook to prepare its nationally determined contribution and, if available, on the Party's implementation plans, including, as appropriate:	
a(i)	Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner;	<p>The Kingdom established the Designated National Authority (DNA), a robust and functional institutional arrangement. The DNA committee is represented by a diverse group of representatives from government, semi-government, and private sector entities, ensuring a comprehensive perspective. As such, the DNA acts as the focal point for preparing instituted reporting requirements, including the NDC, as part of the UNFCCC and its Paris Agreement. For further details refer to "Section 8.5 Capacity Building" and "Section 9. Monitoring and Reporting"</p> <p>"Section 3.1. National Circumstances and Institutional</p>

		Arrangements” in BTR1.
A(ii)	Contextual matters, including, inter alia, as appropriate;	
a(ii)a	National circumstances, such as geography, climate, economy, sustainable development and poverty eradication;	<p>Refer to “Section 3.1. National Circumstances and Institutional Arrangements” of the Kingdom's BTR1. Covering:</p> <ul style="list-style-type: none"> • Government Structure • Population Profile • Geographic Profile • Economic Profile • Climate Profile • Sector Details • The Impact of National Circumstances on GHG Emissions and Removals <p>For further unique national circumstances, refer to “Section 4.3.7. Hajj and Health” of the Kingdom’s BTR1. Covering:</p> <ul style="list-style-type: none"> • Background • Demography of Hajj Pilgrims • Recent Infrastructure and Service Provision Initiatives by Saudi Arabia • Health Support Provided by the Kingdom

<p>a(ii)b</p>	<p>Best practices and experience related to the preparation of the nationally determined contribution;</p>	<p>The Kingdom established the Designated National Authority, as a unique institutional arrangement that consolidates essential climate related functions within a single framework. This structure facilitates the collection and management of data on policies, projects, and plans, ensures effective preparation and tracking of the NDC, and enables the production of national reporting requirements. By having a committee comprised of government, semi-government, and private sector stakeholders representing more than 90% of the Kingdom’s GHG emissions, thus ensuring that the arrangement provides a coordinated and comprehensive approach. In addition, the DNA oversees the implementation of cooperative approaches under Article 6 of the Paris Agreement, if any, ensuring consistency, transparency, and integrity across both reporting and market-related functions in support of the Kingdom’s NDC.</p> <p>In addition, refer to “Section 7. Response Measures” and “Section 9. Means of Implementation”.</p>
<p>a(ii)c</p>	<p>Other contextual aspirations and priorities acknowledged when joining the Paris Agreement;</p>	<p>In this regard, the following priorities have been acknowledged when joining the Paris Agreement:</p> <p>Nationally determined pathways shall be respected, and no barriers should be imposed to undermine the agreed principles of just transitions, thus safeguarding the nationally determined nature of the NDC and ensuring that climate action, including climate resilient development, is assessed based on emission reductions and not targeting resources. The Kingdom’s national strategic plans underscore the importance of sustainable development</p>

		<p>across economic and social parameters in line with the objective of the Convention and the goals of its Paris Agreement, whereby the implementation of the agreement accommodates different approaches.</p>
b	<p>Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16- 18, of the Paris Agreement;</p>	<p>Not applicable.</p>
c	<p>How the Party's preparation of its nationally determined contribution has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement;</p>	<p>The outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement, have been considered during the preparation of KSA's 2nd NDC in accordance with the principle of common but differentiated responsibilities and respective capabilities, priorities and needs. Decision 1/CMA.5 referenced a wide variety of signals which related to mitigation, adaptation, means of implementation, response measures and others, relevant to achievement of the objectives of the Paris Agreement, in line with respective national circumstances and pathways. Further information and details can be found across sections: "3. Ambition and Fairness", "5.1 Contribution to Economic Diversification with Mitigation Co-Benefits", "5.2 Contribution to Adaptation", "6. Response Measures", and "8. Means of Implementation" .</p>

d	Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	
d(i)	How the economic and social consequences of response measures have been considered in developing the nationally determined contribution;	Refer to “Section 6. Response Measures” . Further information and details can be found across “Section 3.4. Impact of Climate Change Response Measures” in the Kingdom’s BTR1.
d(ii)	Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	Refer to “Section 5.1 Contribution to Economic Diversification with Mitigation Co-Benefits” and “Section 5.2 Contribution to Adaptation”.
5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals:		
a	Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals	Saudi Arabia accounts for anthropogenic greenhouse gas emissions and removals using 2006 IPCC Guidelines as agreed upon by the Conference of the Parties serving as the

	<p>corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;</p>	<p>meeting of the Parties to the Paris Agreement (CMA) and in alignment with 18/CMA.1.</p>
b	<p>Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;</p>	<ul style="list-style-type: none"> • The implementation of policies, measures, or strategies under the NDC follows a project-based GHG accounting approach, using methodologies consistent with relevant UNFCCC decisions and guidance adopted by the CMA, including the use of the 2006 IPCC Guidelines. • The Kingdom's BTR1 outlines the assumptions or methodological approaches that are utilized by the Kingdom of Saudi Arabia in accounting for the implementation of policies, measures, or strategies relevant to its NDC implementation.
c	<p>If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;</p>	<p>Refer to section 5(a) of this table.</p>
d	<p>IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;</p>	<p>Refer to section 5(a) of this table.</p> <p>In line with decision 18/CMA.1, Saudi Arabia uses the 100-year time-horizon global warming potential (GWP) values from the IPCC Fifth Assessment Report as agreed upon by the CMA, to report aggregate emissions and removals of GHGs, expressed in CO₂eq.</p>

e	Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	
e(i)	Approach to addressing emissions and subsequent removals from natural disturbances on managed lands;	Not applicable.
e(ii)	Approach used to account for emissions and removals from harvested wood products;	Not applicable.
e(iii)	Approach used to address the effects of age-class structure in forests	Not applicable.
f	Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	
f(i)	How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources and models used;	Refer to “Section 2. NDC Ambition” and “Section 3. Dynamic Baselines” .
f(ii)	For Parties with nationally determined contributions that contain non greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable;	The Kingdom’s NDC contains several non-GHG components, which it may expand to other non-GHG metrics at a later time. Non-GHG components currently include: <ol style="list-style-type: none"> 1. Renewable Energy: Further implementation, conversions and methodologies will be disclosed in accordance with the Enhanced Transparency Framework (ETF) in the

		<p>Biennial Transparency Reports and Article 6 reporting.</p> <p>2. CDR/Afforestation: Further implementation, conversions and methodologies will be disclosed in accordance with the Enhanced Transparency Framework in the Biennial Transparency Reports and Article 6 reporting.</p>
f(iii)	For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers is estimated;	Not applicable.
f(iv)	Further technical information, as necessary;	Not applicable.
g	The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	The Kingdom of Saudi Arabia intends to fulfil its NDC objectives through implementation of domestic projects and does not currently have any active agreements or discussions to participate in cooperative approaches under Article 6 of the Paris Agreement. The Kingdom reserves the right to participate in cooperative approaches under Article 6 for NDC fulfilment purposes. The Kingdom will follow the relevant guidance in accordance with the decisions adopted by the CMA to accurately account for and report any use of or participation in a voluntary cooperation in case it decides to participate in such agreements.
<p>6. How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances</p>		
a	How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances;	Refer to “Section 3. Ambition and Fairness”.

b	Fairness considerations, including reflecting on equity;	Refer to “Section 3. Ambition and Fairness”. The unilateral climate-related trade restrictive measures introduced by other parties collectively pose challenges to achieving the Kingdom’s NDC and its economic diversification plan and climate action efforts. These trade measures include instruments such as the Carbon Border Adjustment Mechanism (CBAM) and associated cross-border corporate, and regulatory frameworks which includes Corporate Sustainability Due Diligence Directive (CSDDD).
c	How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;	Refer to “Section 2. NDC Ambition” and “Section 3. Ambition and Fairness”.
d	How the Party has addressed Article 4, paragraph 4, of the Paris Agreement;	Refer to “Section 3. Ambition and Fairness”.
e	How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	Not applicable.

7. How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2

a	How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2;	Through mitigation actions across energy, industrial, waste, and land-use sectors, combined with adaptation and resilience-building measures, the NDC contributes to safeguarding ecosystems, ensuring food and water security, and enabling sustainable economic development in line with national priorities.
b	How the nationally determined contribution contributes towards Article 2, paragraph	The Kingdom’s nationally determined contribution encompasses a range of mitigation and adaptation strategies that reduce greenhouse gas emissions. It includes

<p>1(a), and Article 4, paragraph 1, of the Paris Agreement.</p>	<p>projects across various sectors including energy, industry, waste, and land-use sectors, as well as carbon sequestration initiatives such as CCUS, afforestation and land restoration. Together, these efforts advance long-term climate stabilization, strengthen adaptation, and promote sustainable development.</p>
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