

# The Intended Nationally Determined Contribution of the Kingdom of Saudi Arabia under the UNFCCC

**Riyadh, November 2015**

The Kingdom of Saudi Arabia is pleased to submit its Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat pursuant to the decisions 1/CP.19 and 1/CP.20.

The INDC of the Kingdom of Saudi Arabia is based on the principles listed in Art. 3 of the UNFCCC and the approach specified in the Economic Diversification Initiative adopted as UNFCCC decision 24/CP.18 in Doha 2012. The Kingdom will engage in actions and plans in pursuit of economic diversification that have co-benefits in the form of greenhouse gas (GHG) emission avoidances and adaptation to the impacts of climate change, as well as reducing the impacts of response measures. This will help the Kingdom to achieve its sustainable development objectives. In this spirit, the Kingdom of Saudi Arabia desires to actively contribute to the UNFCCC negotiations maximizing long term benefits and minimizing potential negative side effects for Saudi Arabia.

## *Executive Summary*

The actions and plans outlined in this submission seek to achieve mitigation co-benefits ambitions of up to 130 million tons of CO<sub>2</sub>eq avoided by 2030 annually through contributions to economic diversification and adaptation. These ambitions are contingent on the Kingdom's economy continuing to grow with an increasingly diversified economy and a robust contribution from oil export revenues to the national economy. It is also premised on the fact that the economic and social consequences of international climate change policies and measures do not pose disproportionate or abnormal burden on the Kingdom's economy. This is fully consistent with Article 3 paragraph 2 and Article 4 paragraph 8(h) and 10 of the United Nations Framework Convention on Climate Change.

A dynamic baseline will be developed on basis of a combination of two scenarios. One scenario assumes economic diversification with a robust contribution of oil export revenues, and the other on an accelerated domestic industrialization based on sustainable utilization of all indigenous resources including oil, gas and minerals.

## *I. National Circumstances*

Physical, economic and social factors determine the vulnerability of a country to climate change and the Kingdom of Saudi Arabia exhibits significant vulnerability in all three aspects. The Arabian Desert dominates the country, which spans approximately 2.2 million km<sup>2</sup> of the Arabian Peninsula. Current climatic conditions range from semi- to hyper aridity, with

extremely low rainfall (<150mm/year in most areas), high evapotranspiration and resultant water scarcity. In the long term, a significant share of the infrastructure on the coastlines may be vulnerable to sea level rise. Trade and services may also be vulnerable to heatwaves and sandstorms as well as other indirect vulnerabilities including price volatility in exports and imports of goods and services.

1. Economic diversification is a key factor influencing the stability and sustainability of the growth of any country's economy, hence an economy's reliance on one income resource puts at risk its ability to maintain a level of growth in the long run. Oil production, processing and export are the primary economic activities of the Kingdom of Saudi Arabia, however there are opportunities for gas, minerals and their derivatives to contribute to the Kingdom's economy.

2. From 1970 to date, the Kingdom of Saudi Arabia has developed ten 5-year national development plans (covering the period 1970-2019) to guide the development process for the Kingdom and provide economic and social stability in the medium to longer term. Central to all these plans is the policy of economic diversification designed to diversify the Kingdom of Saudi Arabia's sources of national income and reduce dependence on revenues from a single source by increasing the share of other productive sectors in gross domestic product. These sectors include the manufacturing industries, energy and related derivatives, mining, tourism and information technology industries.

3. Two scenarios applied for determining dynamic **baselines for the period 2000–2030** are differentiated into three time-periods. First time period covers the years 2000-2015. The year **2000** is used because it is the year that most recent inventory data obtained using the **Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories** is available (second national communications). Second and third time- periods are from 2016 to 2020 and 2021-2030 respectively.

3.1. Scenario 1: Economic diversification with a robust contribution from oil and its derivatives export revenues. Export revenues channelled into investments in high value-added sectors such as **financial services, medical services, tourism, education, renewable energy and energy efficiency technologies** to enhance economic growth. **Ambitions outlined in this INDC are set under this scenario.**

3.2. Scenario 2: Accelerated domestic industrialization based on sustainable utilization of oil and gas. A heavy industrial base built to use domestic oil resources as feedstock or energy source. Increasing contributions of petrochemical, cement, mining and metal production industries to the national economy. Economic growth will be much slower under this scenario, and will be difficult for the Kingdom to finance its INDC ambitions with domestic resources. In this case, this INDC will be adjusted to account for this scenario.

3.3. The main difference between the two baseline scenarios is the allocation of oil produced for either domestic consumption or export. While exported oil will not contribute to the GHG emissions of Saudi Arabia, the domestic consumption will increase its GHG emissions. For the ex-ante estimations, the baseline is determined based on differently weighted combinations of the two scenarios. Between 2016 and 2020, Saudi Arabia reserves the right to further elaborate on its INDC and make additional submissions to

account for these scenarios. During the run-up to the validity period of the INDC, the baseline scenarios will be updated.

## **II. Contribution to *Economic diversification with mitigation co-benefits***

The Kingdom of Saudi Arabia has ambitious plans to diversify its economy away from heavy reliance on income generated from a single resource. Therefore, contribution to the climate ambition will be integrated in the future policy to promote this plan. The INDC is thus driven by the aim to implement measures that accelerate the diversification process under paragraph 3.1 above (scenario 1). The following actions and plans will generate mitigation co-benefits and contribute to economic diversification:

1. **Energy Efficiency:** implement measures and initiatives that will promote, encourage and support actions in generating mitigation co-benefits in energy efficiency. Strengthen the Saudi Energy Efficiency Program and expand its focus. Currently, the program focuses on three main sectors, namely industry, building and transportation that collectively account for over 90% of the energy demand in the Kingdom. Support initiatives that will produce far-reaching co-benefits, such as the introduction of efficiency standards in the building and transportation sectors as well as the implementation of energy efficiency measures, in various industrial establishments. Encourage and expedite the conversion of single cycle power plants to combined cycle power plants.
2. **Renewable energies:** Invest and implement ambitious programs for renewable energy to increase its contribution to the energy mix. The scope will include solar PV, solar thermal, wind and geothermal energy and waste to energy systems. A competitive procurement process for renewable energy is currently under preparation and evaluation.
3. **Carbon Capture and Utilization/Storage:** promote and encourage actions in this area. As part of its sustainability programme, the Kingdom of Saudi Arabia plans to build the world's largest carbon capture and use plant. This initiative aims to capture and purify about 1,500 tons of CO<sub>2</sub> a day for use in other petrochemical plants. Saudi Arabia will operate on pilot testing basis, a Carbon Dioxide – Enhanced Oil Recovery (CO<sub>2</sub>-EOR) demonstration project to assess the viability of CO<sub>2</sub> sequestration in oil reservoirs and any other useful applications. Forty million standard cubic feet a day of CO<sub>2</sub> that will be captured, processed and injected into the Othmaniya oil reservoir. This pilot project has comprehensive monitoring and surveillance plans. The success of this pilot will determine the extent this program will contribute to the Kingdom's ambition in addressing climate change.
4. **Utilization of gas:** Encourage investments on exploring and producing natural gas to significantly increase its contribution to the national energy mix. The success on realizing the Mitigation co-benefit ambition in this area will depend on the success of exploring and developing natural gas.
5. **Methane recovery and flare minimization:** Actions will be taken to conserve, recover and reuse hydrocarbon resources and minimize flaring and fugitive emissions.

### *III. Contributions to Adaptation*

Saudi Arabia is continuously investing considerable efforts and resources in activities that help protect and renew the Kingdom's natural environment including protection of the biodiversity of land, seas and coastlines. Saudi Arabia differentiates its adaptation measures into those with mitigation co-benefits and those that are entirely aimed at adaptation and raising resilience. Adaptation measures can also contribute to economic diversification. The INDC in this area is driven by the aim to implement measures that will enhance resilience and accelerate the diversification process of its economy under paragraph 3.1 above (scenario 1).

1. **Adaptation with mitigation co-benefits:** The following adaptation measures are expected to have significant mitigation co-benefits, depending on their degree of implementation and availability of funds to pursue planned activities:

- 1.1. **Water and waste water management:** Implement actions that will promote and encourage the reduction, recycle and reuse of water and wastewater in the municipal, industrial and commercial sectors in a manner that will reduce energy consumption, desalinated water production and unground leakage.
- 1.2. **Urban planning:** Encourage actions that promote the development and use of mass transport systems in urban areas. Take the necessary actions to expedite the development of the metro system in Riyadh. In addition support and expedite the planning and development of metro systems in Jeddah and Dammam.
- 1.3. **Marine Protection:** Implement coastal management strategies that are designed to reduce coastal erosion, increase the sinks for blue carbon, maintain related ecosystems and address the threats that climate change poses for marine livelihoods. Support the planting of mangrove seedlings along its coasts. In addition, strengthen and enhance the coral reef restoration program throughout the northwestern Arabian Gulf.
- 1.4. **Reduced desertification:** Undertake measures to enhance desertification management. Support actions that will promote the stabilization of sand movements around cities and roads, while increasing sinks for capacity through using green belts as barriers. Develop and enhance arid and semi-arid rural areas through various natural resource conservation activities, biodiversity and eco-system based adaptation efforts. The objective is to improve soil quality, water, pasture and wildlife resources through a system of protected areas and reserves. Mitigation co-benefits may include those relating to reducing land degradation and improving land management practices, especially for agriculture and forestry.

2. **Adaptation undertakings:** The following adaptation contributions are expected to support Saudi Arabia's efforts to address climate change and raise resilience to its impacts:

- 2.1. **Integrated coastal zone management planning (ICZM):** Take the necessary action to develop and implement ICZM plans that would take into account the protection of coastal infrastructures such as roads, residential areas, industrial complexes, desalination plants, seaports, etc.;

- 2.2. **Early Warning Systems (EWS): Develop** and operationalize EWS that would reduce vulnerability due to extreme weather events such as rainstorms, floods and dust storms by increasing resilience of infrastructure;
- 2.3. **Integrated water management planning:** Develop and implement plans that will harness new sources of freshwater, construct additional dams for collection of drinking water and recharging of aquifers.

#### *IV. Addressing Response Measures*

Saudi Arabia will take the necessary actions to understand international policy measures to response to climate change, assess the implications of these measures on its economy, and take necessary steps to raise its resilience to these impacts. International cooperation in addressing response measures is important for the Kingdom to achieve its sustainable development objectives and realize its ambitions in addressing climate change; these include:

1. Socio-economic research studies to assess the impacts of mitigation policy measures implemented outside Saudi Arabia on the Saudi economy, including collection of information and development of modelling tools.
2. Research and development activities to provide technologies that enhance economic competitiveness. Research into understanding the long-term impacts of response measures on energy market stability and to develop measures that can sustain a stable energy market in the long run. Technology cooperation on the basis of the approaches outlined in paragraphs 24-29 in decision 5/CP.7 will allow for the identification of appropriate technological options, which are consistent with national priorities, and domestic human and financial resources in order to promote enabling environment for economic diversification and technological development (e.g. carbon capture utilization and storage).
3. The long-term aim of such measures is to achieve a growth of domestic industries that exceeds the loss of revenue from oil export triggered by decrease in fossil fuel consumption and market distorting actions such as fuel taxes, subsidies and incentives for all complementary sources of energy.

#### *V. Timeframe*

The assessment of baseline covers the period 2021 to 2030. As time progresses, this assessment will be expanded until 2050. Estimates and ambitions will be adjusted depending on the level of development and progress toward economic diversification (as outlined in paragraph 3 above) as well as feedbacks from different sectors of the economy.

#### *VI. Means of Implementation*

The implementation of Saudi Arabia's INDC is not contingent on receiving international financial support, but the Kingdom of Saudi Arabia sees an important role for technology cooperation and transfer as well as capacity building for INDC implementation.



1. The ambitions set out in this INDC would **require technical assistance and sustained capacity building efforts and upgrading of skills at the individual and systemic levels to support their implementation**. Saudi Arabia therefore looks for benefiting from all the assistance made available to developing countries in respect of enabling activities within the framework of the UNFCCC.
2. Cooperate on research programme on the impacts of response measures on international energy markets and economies of fossil fuel exporting countries, as well as success parameters of economic diversification initiatives. Moreover, such international cooperation should focus on the development, diffusion and transfer of less greenhouse gas-emitting advanced technologies including fossil fuel technologies.
3. With regard to adaptation, collaboration on the following technologies is seen as crucial: (a) water saving, recycling, capture, irrigation and sustainable management for agriculture purposes; (b) early warning system against meteorological extreme events (such as floods, storms and droughts; and (c) transportation technologies that are resilient to the adverse effects of climate change while reducing and/or capturing transportation-related emissions. Saudi Arabia aims to create long-term partnerships with universities, research institutes and the private sector in order to enable utilization of these technologies.

#### ***VII. Monitoring and reporting progress on INDC implementation at the national level***

4. The Kingdom of Saudi Arabia acknowledges that a monitoring, reporting and verification (MRV) system forms an essential part of its national arrangements for ensuring the successful delivery of its economic diversification and adaptation measures with mitigation co-benefits. The Kingdom's MRV system for INDC will be an integral part of the existing and future monitoring and reporting structures under the oversight of its Designated National Authority. The MRV system will be deployed to track progress towards achieving INDC actions and projects and any modifications thereof.

#### ***VIII. Ambition and Fairness***

As a Party to the Convention, the Kingdom of Saudi Arabia's INDC is based on the UNFCCC and in particular, its Article 3 paragraph 2 and Article 4 paragraph 8 (h) and 10. Saudi Arabia is in the process of diversifying its economy. Being highly vulnerable to climate change and actions and plans to address it, the Kingdom of Saudi Arabia will be engaged in several actions to address climate change and make its development more sustainable. The INDC's focus on economic diversification as well as adaptation actions with **mitigation co-benefits** allows to effectively address and tap on synergies for both responses to climate change. The ambition is also reflected in the high capital and investment volumes required for economic diversification, particularly if structural changes to the economy is required and to projects and actions outlined to implement the INDC.

The contribution achieved through the mitigation co-benefits fulfils the requirement of fairness, given that the sum of these contributions leads to a significant deviation from a business-as-

usual emissions path for an economy that highly depends on oil and gas. The measures outlined in this INDC would achieve significant annual mitigation co-benefits estimated to be up to 130 million tons of CO<sub>2</sub>eq by 2030. The measures focus on harnessing the mitigation potential in a way that prevents “lock in” of high-GHG infrastructure. These contributions would only be possible under scenario 1 pathway of sustained economic growth.