

# Evaluation of Saudi Arabia's Climate Change Policy: Circular Carbon Economy and Green Initiatives

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## **Abstract**

Saudi Arabia announced on October 23, 2021, that it aims for net zero greenhouse gas emissions by 2060 and will reduce 278 million tons in 2030 compared to the business-as-usual (BAU) scenario. However, there is not yet a detailed path to reach the 2060 goal. The 2030 goal may not necessarily be an ambitious goal if it permits increase of emissions from the 2019 level. The direction Saudi Arabia has taken, however, can be highly appreciated. The Circular Carbon Economy, which explored various ways to utilize carbon, is an important perspective in the debate on climate change. In addition, the Green Initiatives focus on renewable energy, afforestation, and clean energy technology which are widely welcomed by the international community as an important direction. Therefore, although the feasibility of the 2060 target cannot be fully foreseen, the direction of Saudi Arabia's climate change policy itself can be positively evaluated.

**Key words:** Saudi Arabia, Circular Carbon Economy, Green Initiatives, Net Zero

## **1. Introduction**

On October 23, 2021, Saudi Arabia announced that it would seek to achieve net zero greenhouse gas emissions by 2060 and reduce GHG emissions in 2030 by 278 million tons from the business-as-usual scenario. As an approach to these goals, Saudi Arabia has adopted the concepts of the Circular Carbon Economy (CCE) and the Green Initiatives. This paper attempts to clarify the characteristics of the two concepts and consider the feasibility of the 2030 and 2060 goals.

## **2. CCE**

Saudi Arabia took maximum advantage of its chairmanship for a Group of 20 summit in 2020 to promote the CCE concept. At the G20 summit, the CCE was defined as "a voluntary, holistic, integrated, inclusive, pragmatic and complementary approach to promote economic growth while enhancing environmental stewardship through managing emissions in all sectors including, but not limited to, energy, industry, mobility and food." In other words, it refers to a system to run an economy while circulating carbon.

The CCE concept was developed in 2019 by Eric Williams<sup>1)</sup>, a research fellow at the King Abdullah Petroleum Studies and Research Center (KAPSARC), based on the idea of regarding atmospheric carbon as circular and U.S. architect William McDonough's idea of considering carbon as a usable resource<sup>2)</sup>.

Supporting the CCE are 4R (reduce, reuse, recycle and remove

carbon) technologies. Table 1 indicates representative 4R technologies. These technologies had been individually cited. The CCE concept has made a difference by systematizing them.

**Table 1** 4R technologies in the CCE concept<sup>3)</sup>

Reduce	Reuse	Recycle	Remove
Energy saving Renewable energy Nuclear	Enhanced oil recovery (EOR)	Conversion to chemical products Conversion to fuels	Direct air capture (DAC) Carbon capture and storage (CCS) Afforestation

Notably, the CCE concept does not necessarily regard carbon as evil. Carbon is regarded as useful for enhanced oil recovery and available for conversion to chemical products and fuels. Hopes are placed on direct air capture (DAC) technology to capture emitted carbon. The CCE concept sheds light on technologies to utilize and capture carbon and paves the way for an argument that fossil fuel consumption emitting carbon dioxide would have no climate change problem if such technologies were developed. As a matter of course, DAC and carbon capture and storage (CCS) technologies still have cost problems and are not available for immediate commercialization. The CCE concept places hopes on future technological development.

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### 3. Green initiatives

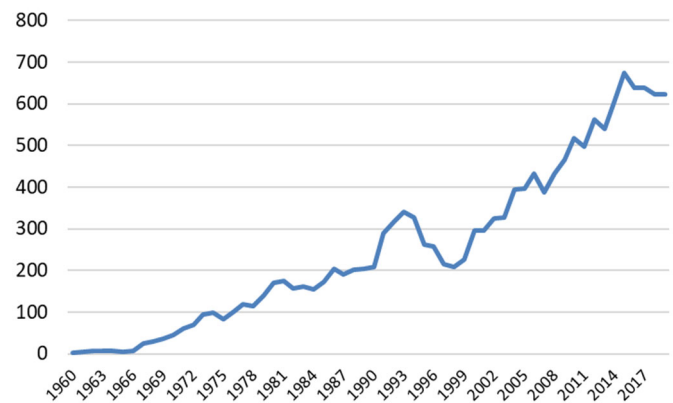
The green initiatives are the Saudi Green Initiative and the Middle East Green Initiative announced by Saudi Arabia in March 2021. The Saudi Green Initiative calls for planting 10 billion trees in Saudi Arabia in several decades, boosting renewable energy's share of its power mix to 50% by 2030 and utilizing clean hydrocarbon technologies. The Middle East Green Initiative seeks to plant 40 billion trees in countries neighboring Saudi Arabia in several decades and promote cooperation between Saudi Arabia and its neighbors in the clean energy field.

The green initiatives indicate how technologies given in the CCE concept would be used for climate change countermeasures. Particularly, they cite afforestation, renewable energy and clean hydrocarbon technologies. The technologies are expected to include carbon capture, utilization and storage (CCUS), cutting methane leaks and using renewable energy to extract fossil fuels<sup>4</sup>. These initiatives thus pick up technologies that are easier to commercialize among CCE-related technologies.

Specifics of the green initiatives were clarified at the Saudi Green Initiative Forum and the Middle East Green Initiative Summit in October 2021. At the forum, Saudi Arabia set a goal of cutting greenhouse gas emissions by 278 million tons from the business-as-usual scenario by 2030 and presented the Updated First Nationally Determined Contribution (NDC) including the goal. The NDC clarified a policy of focusing on energy saving, renewable energy, green hydrogen, ammonia, CCUS, blue hydrogen, gas utilization and methane reduction<sup>5</sup>. At the Middle East Green Initiative Summit, a plan was given to invest \$10.4 billion in clean energy projects.

### 4. Feasibility of 2030/2060 goals

At the forum, Saudi Energy Minister Abdulaziz bin Salman explained that the reduction of 278 million tons in GHG emissions by 2030 would result in the year's emissions between 741 million and 849 million tons. This estimate, which was not included in the Updated First NDC, means that GHG emissions would increase from 660 million tons in 2019. While Saudi Arabia has emphasized that the emission reduction goal more than doubles from the initial goal of 130 million tons before updating, it admits that emissions in 2030 would increase from 2019. Thus the new goal may not necessarily be an extremely ambitious one. Figure 1 indicates that Saudi Arabia's CO<sub>2</sub> emissions have persistently increased. Even the new goal confirms the trend.



**Figure 1** CO<sub>2</sub> emissions in Saudi Arabia (in millions of tons)<sup>6</sup>

Various efforts may be required to achieve net zero emissions in 2060. Energy Minister Abdulaziz explained that the target year was set at 2060 because many technologies for reducing emissions would fail to mature before 2040. These technologies apparently include CCUS that has failed to diffuse due to high costs. This means that the resolution of the cost problem would hold the key to the achievement of the net zero emission goal for 2060.

In addition, Saudi Arabia will have to rapidly increase renewable energy's share of the power mix. In April 2021, Saudi Arabia managed to open its first commercial-scale solar photovoltaics plant. Earlier, the renewable energy share was close to zero. Many renewable energy projects are being launched, but how fast the renewable energy share would rise is difficult to predict. This is the same case with progress in energy savings and the diffusion of electric vehicles. The 2060 zero emission goal represents hopes, failing to provide any specific path to the goal or having any concrete ground.

Nevertheless, the direction given by Saudi Arabia may be commendable. The CCE concept exploring various carbon uses has caused a stir in climate change talks. The direction of the green initiatives seeking renewable energy expansion, afforestation and clean energy technology development is also unarguable in the international community. While the feasibility of the 2060 goal is uncertain, the direction of Saudi Arabia's climate change countermeasures is apparently commendable.

### Reference

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