

The Pathway to a Green Gulf: A Review and Analysis of the Evolution of Saudi Arabia, Qatar, and the United Arab Emirates' Climate Change Positions

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The issue of climate change resides high on the global agenda, and the hydrocarbon-rich countries of the Gulf region are no exception. This article reviews how Qatar, Saudi Arabia, and the United Arab Emirates, three of the most significant oil and gas exporting countries in the world, approached international climate negotiations, and how their respective positions evolved with them eventually becoming signatories to the Paris Agreement in 2015. This article details how the three countries' perspectives transitioned from staunchly resisting the development of a global decarbonization framework to one whereby they are undertaking leading roles in shaping the international climate discourse. The three countries had long opposed global climate negotiations as they feared that international decarbonization efforts could hobble their hydrocarbon export revenue generation and economic growth. These three countries are perhaps emblematic of how fossil-fuel producing countries could adapt to global climate change policies throughout this decade. An analysis of the three selected countries' positions toward climate change and their decarbonization efforts, as outlined in their nationally determined contributions (NDCs), are assessed in-depth to critically understand how the Gulf region and the broader Middle East by extension intends to manage the complexities of climate change. In the context of the collective effort to limit global warming to 1.5 degrees Celsius, conceptualizing how these countries may arrive at their Paris Agreement pledges is a crucial pillar in comprehending the potential progression of the region's development and the transformation of the global energy market.

I. Introduction: Climate Change and the Gulf Region

The Gulf region has faced a host of challenges for decades, comprising a range of internal and external threats.¹ The Gulf countries now recognize that cli-

mate change potentially gave birth to a new host of systemic threats, such as desertification, food insecurity, internal conflict, extreme heat waves, domestic population displacement, and a host of other destabilizing forces.² The Middle East as a region arrived at the awareness that climate change offers unparal-

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1 Some of the external threats emanated from the 'revolutionary' Middle Eastern countries of Libya, Syria Iraq, and to a lesser extent, Algeria, that attempted to spread pan-Arab nationalism in the more conservative monarchical states in the Gulf. Iraq, for instance, posed a significant threat to the region with its invasion of Kuwait in 1991. Iran as well posed, and still poses, both an external military threat and an internal threat by its promotion of external Shiite political sectarianism throughout the region. Additionally, Arab nationalist parties and cells during the

1950s-60s caused bouts of instability, while the advent of domestic Shiite political agitation in the 1970s, and then the rise of various Islamist organizations during the 1990s until the present, are still issues of concern for the Gulf monarchies. See, generally, Justin Dargin, *Desert Dreams: The Quest for Arab Integration from the Arab Revolt to the Gulf Cooperation Council* (Republic of Letters, 2012).

2 According to a 2013 study by John Waterbury, decreased rainfall that occurred prior to 2011 led to desertification in agricultural areas in eastern Syria, which resulted in the death of at least 85% of the livestock. This stimulated a mass internal migration of villagers to the larger cities where they formed communities of underpaid workers. The large internal migration is not thought to

leled threats to its way of life and potential opportunities to transform their economies into dynamic growth engines as they engage in macroeconomic diversification.³

The significant multibillion dollar investments in renewable energy production are positioned as a pathway to allow the countries to meet their rising power demand and preserve more of their hydrocarbon inputs for downstream expansion, such as in petrochemicals, fertilizers, and the energy-intensive industries. The region, indeed, has come a long way from believing that climate change science was a hoax perpetrated by Western countries to obstruct their economic development to becoming major participants in multilateral climate conferences.⁴ In a significant departure from its earlier stances, the Saudi Crown Prince, Mohammed Bin Salman, announced an unequivocal link between climate change and the health of the Saudi citizenry.⁵

This article reviews Qatar, Saudi Arabia, and the UAE because these three countries offer a viable comparison and contrast as they represent the largest economies in the region, and each is a global leader in the hydrocarbon sector. Additionally, Saudi Arabia's stance in international climate negotiations must be understood as it boasts the largest economy in the Gulf Cooperation Council (GCC), is one of the world's largest oil producers and is the world's largest oil exporter.⁶ Qatar, for its part, is one of the world's largest Liquefied Natural Gas (LNG) producers and exporters, and as the world begins the arduous

process of decarbonization, its global role will be ever more critical. The UAE represents a Gulf country that is steadily engaging in substantive macroeconomic diversification and serves as a template for how other Gulf countries could transform themselves from being mono-exporters to a more diversified economic base. Therefore, an analysis of the three selected countries' positions toward climate change, and their decarbonization efforts should be assessed in-depth to critically understand how the Gulf region, and the broader Middle East by extension, intended to manage the complexities of climate change.

Qatar, Saudi Arabia, and the UAE are currently implementing policies designed to limit their hydrocarbon consumption, mostly of natural gas, to meet their respective energy-related challenges. These countries are also taking steps to limit their carbon dioxide emissions as the reduction of carbon emissions also leads to a decline in hydrocarbon consumption. Among these steps are (1) the introduction of energy efficiency measures, (2) the incremental reconfiguration of their respective domestic energy pricing regimes, (3) the introduction of policies that require fuel switchovers from more carbon-intensive oil to natural gas and renewable/alternative energy, and (4) signing international agreements to reduce carbon emissions.

Before the Durban Platform in 2011, the energy-rich Gulf countries viewed climate change as a hoax and that global decarbonization would negatively impact their economic growth. The Gulf countries con-

have caused the Syrian civil war. But it is thought to have been a major contributing factor in overall disenfranchisement and the initial outbreak of violence. It is also considered that the vast increase in food prices in the Middle East during the mid-to-late 2000s was exacerbated by climate change and was, again, a major contributing factor in the Arab Spring in 2011. John Waterbury, 'The Political Economy of Climate Change in the Arab Region' (2013) Arab Human Development Report: United Nations Development Programme.

3 The Arab Forum for Environment and Development conducted a pan-Arab survey in 2009 that discovered 98% of respondents believed that the climate had changed. And 89% believed that this was anthropogenic in origin. See, (ed) Mostafa K. Tolba and Najib W. Saab, 'Arab Environment: Climate Change: Impact of Climate Change on Arab Countries' (2009) Report of the Arab Forum for Environment and Development 2. The leaders of Saudi Arabia and the UAE have sought to position themselves as taking advantage of economic opportunities associated with decarbonization. As representative of the region's changing outlook, Sheikh Mohammed bin Rashid Al Maktoum, vice president and prime minister of the United Arab Emirates and Ruler of Dubai, announced that, 'We are committed to seize the opportunity to cement our leadership on climate change within our region and take this key economic opportunity to drive development, growth and new jobs as we pivot our economy and nation to net zero.'

See, Reuters, 'The UAE Launches Plan to Achieve Net-Zero Emissions by 2050' (October 7, 2021).

4 This belief was not limited to the Gulf energy-rich countries, China and India at various times promulgated the same theory. The so-called 'Climategate,' which involved hacked emails from the University of East Anglia prior to the 2009 climate negotiations in Copenhagen, was hailed as irrefutable evidence by the Saudi negotiating team and other developing countries that there was, 'No relationship whatsoever between human activities and climate change.' Mohammad Al-Sabban, the lead Saudi climate negotiator, stated that, 'The volume and the size of those sacrifices must be predicated on a sound scientific basis and must be built on a secure foundation of information, which is what we found now is not true and that our high level of trust had suffered,' Richard Black, Climate E-Mail Hack 'Will Impact on Copenhagen Summit' (2009) BBC News; Saudi Arabia Tries to Stall Global Emissions Limits, NPR (Dec. 10, 2009).

5 Michael Safi et al, So What Has the Rest of the World Decided to Do about Climate Change? *The Guardian* (London April 19, 2021).

6 The Cooperation Council of the States of the Arabian Gulf, informally known as the Gulf Cooperation Council or GCC, was officially established in 1981. It is a regional, intergovernmental, political and economic organization composed of Saudi Arabia, the UAE, Qatar, Oman, Bahrain and Kuwait.

sidered that international decarbonization efforts were merely a stratagem perpetrated by the developed countries to forestall the economic development of the Global South. However, as with the widespread gas allocation shortages and the geopolitical repercussions after the Arab spring, Saudi Arabia, Qatar, and the UAE considered that decarbonization could improve their economic health by forcing them to engage in economic diversification instead of harming their economic growth and reduce their dependence on their mono-exporting status.

This article seeks to delineate the contours of the multilateral carbon trading negotiations to illustrate for the reader how Saudi Arabia, Qatar, and the UAE, as well as the Gulf as a region, approached the discussions and how their respective positions evolved over time with them becoming signatories to the Paris Agreement in 2015. Additionally, the article will assess the relative robustness and effectiveness of the three countries' Nationally Determined Contributions (NDCs) to foster decarbonization and meet their Paris Agreement pledges.

In terms of the structure of this article, Section II analyzes the Gulf countries positions during the Paris Climate Change Conference of 2015 and of COP26 held in Glasgow in November 2021, where the Gulf countries not only agreed that global warming was a collective threat to humankind but pledged to implement changes in their macroeconomic posture to combat it. This agreement heralded a profound shift from denying the reality of climate change to accepting the basic tenets of decarbonization.

Section III discusses the COP26 negotiations and analyzes the positions of the Gulf countries against their latest pledges. Section IV supplies a detailed analysis of the three selected countries' NDCs, greenhouse gas reduction pledges that they submitted prior to the Paris Climate Negotiations in 2015 and will assess the updated NDCs submitted at COP 26 held in Glasgow in November 2021.⁷ This section utilizes the methodology created by the World Resources Institute (WRI) to assess NDCs by a three-point matrix of equitability, transparency, and ambition. Section V concludes the article with an overall assessment of the respective decarbonization postures of Saudi Arabia, Qatar, and the UAE and provides recommendations on how they may create successful decarbonization policies to meet their Paris Agreement commitments and COP26 updated pledges.

II. The Paris Agreement: The Gulf Agrees to Carbon Emissions Reductions

Even though progress generally occurs in fits and starts, the Paris negotiations (CoP 21) held from November 30-December 12, 2015, reconfigured the pathway of past climate negotiations and brought a comprehensive agreement on greenhouse gas reductions. The consensus reached during the Paris Agreement reflected that the representatives of 196 nations agreed to keep increases in the 'global average temperature to well below 2 percent Celsius above preindustrial levels.'⁸ On April 21, 2017, the parties further agreed for each nation to sign the agreement officially.

Most countries arrived at the Paris conference with a voluntary carbon emissions reductions pledge, and the Paris Agreement codified those pledges and created a framework for the signatories to implement those reductions starting in 2020. Each country individually determines its contribution, which the Agreement's language characterizes as 'nationally determined contributions (NDCs).'⁹ But as 2020 was the deadline for the signatories to the agreement to create and submit a plan for longer-term carbon emissions reductions, the Covid-19 pandemic caused a disruption, and the target date had not been met in 2020 for many of the signatories. In that sense, the Paris Agreement is an evolving document insofar as the submitted pledges must be reevaluated and regis-

7 INDCs were submitted prior to the Paris Climate Negotiations. Subsequent to that, the participants ratified their pledges which then became Nationally Determined Contributions (NDCs).

8 This is in the preamble of the Paris Agreement. This was followed by the sentence, '... and to pursue efforts to limit the temperature increase to 1.5 degrees C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.' However, of note was that even though the text of the Paris Agreement indicates that if all the signatories adhere to their pledges, the world is still expected to surpass the critical two degrees of warming threshold. And, as small island nations noted during the proceedings, even keeping a rise to two degrees Celsius would still likely submerge their countries. Roger McLean et al, 'Small islands. Climate Change 2007: Impacts, Adaptation and Vulnerability' (2007) Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. It is expected that subsequent agreements will create broader and deeper carbon reductions. The full text of the Paris Agreement is available at: <<http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>>

9 Paris Agreement, Art 3.

tered every five years to the UNFCCC Secretariat¹⁰ in a collective effort to transition the world closer to the target temperature rise of between 1.5-2 degrees Celsius.¹¹

The Paris Agreement did not set a firm target date for the goal of net-zero emissions of greenhouse gases. Still, it stated that by approximately ‘mid-century,’ any greenhouse gases emitted must be balanced out by removing an equivalent amount from the atmosphere.¹² However, while Covid-19 did cause a fair amount of confusion with many countries unable to meet their submission targets, the pandemic also acted as an impetus for both governments and businesses as they prioritized climate action as part of their Covid-19 recovery plans.¹³ As of 2021, more than 100 countries have signed up to achieve net-zero commitments by 2050 in a climate alliance that the UN has been promoting.¹⁴

Nonetheless, while the pledged NDCs are binding upon the parties, several questions are raised about their obligations, which will necessarily depend upon the interpretation rendered to the text of the language in each provision. Some provisions of the Agreement contain categorical obligations, for example, language that provides that each party is obligated to pursue domestic mitigation measures.¹⁵ Other provisions are less categorical, such as those relating to developing countries’ transition to emissions reduction targets.¹⁶ And yet other provisions have enabling characteristics that merely seek to induce coordinated action on a global scale, one example being the requirement for the joint implementation of Parties’ mitigation obligations.¹⁷ In that vein, the operational framework of the obligations in the Paris

Agreement will depend upon how they are termed and the interpretation of those provisions during implementation.

However, suffice it to say, there is no apparatus to enforce implementation of the treaty’s provisions if, for example, a country fails to set a target in their NDC by a specific date or if a pledged period in the NDC is delayed or otherwise not forthcoming. The global community, at the moment, only has the tools to ‘name and shame’ if a country deviates from compliance.¹⁸ The lack of a robust compliance mechanism and that of a transparency requirement make a consensus of this type especially fragile, particularly given the lack of legal consequences for a willful failure or an inability to perform.

Moreover, the departure of several countries could kindle the exit of even more countries in a vicious circle, thus, causing the entire schema to collapse.¹⁹ This would represent a tragedy of the commons scenario because multilateral environmental agreements depend on consensus and unanimity of the agreement and on the perception that other countries are upholding their obligations in good faith.²⁰

While at previous climate negotiations, the UAE, Saudi Arabia, and Qatar presented a united front on most critical issues, the Paris conference illustrated some variances in negotiating positions (See Table 1 for the core climate negotiating positions of the Gulf countries). However, what was apparent is despite economic concerns about the impact of decarbonization on the Gulf countries, these respective nations appeared to accept the reality of climate change finally, and each presented varying levels of efforts at participation.

10 Paris Agreement, Art 4.9. The initial pledges at the Paris Conference, known as the Intended Nationally Determined Contributions, unless otherwise specified, are to be considered the initial Nationally Determined Contributions.

11 Paris Agreements S 3 Art 23 states, ‘Urges those Parties whose intended nationally determined contribution according to decision 1/CP.20 contains a time frame up to 2025 to communicate by 2020 a new nationally determined contribution and to do so every five years after that under Article 4, paragraph 9, of the Agreement.’ The Paris Decision Text is available at <<http://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf>>

12 Paris Agreement Art 4.1

13 UN, ‘Commitments to Netzero Double in Less than a Year’ (2020) UN Climate Press Release.

14 Megan Darby and Isabelle Garetson, *Which Countries have a Net Zero Carbon Goal*, Climate Home News (June 14, 2019).

15 Paris Agreement, Art 4.2.

16 Paris Agreement, Art 4.4.

17 Paris Agreement, Art 6.

18 Catherine Martini, ‘Transparency: The Backbone of the Paris Agreement’ (2016) Yale Center for Environmental Law and Policy.

19 Bryan Druzin, ‘A Plan to strengthen the Paris Agreement’ (2016) Fordham Law Review 18.

20 Wagner and Wietzman suggested that a potential solution to the free rider issue of international climate treaties would be to form a ‘climate club.’ This group of nations that adhere to climate treaties would impose border adjusted taxes on countries not following their obligations. See, Gernot Wagner and Martin L. Weitzman, *Climate Shock: The Economic Consequences of a Hotter Planet* (Princeton University Press 2015); William Nordhaus, ‘Climate Clubs to Overcome Free-Riding’ (2015) *Issues in Science and Technology* 4; However, as Ostrom suggested, a polycentric approach of overlapping local, regional and global frameworks could be an effective and comprehensive method to combat climate change. See, generally, Elinor Ostrom, ‘A Polycentric Approach for Coping with Climate Change’ (2009) World Bank Policy Research Working Paper No 5095.

Overall, the evolution of understanding the impact of climate change was most dramatically illustrated by the Islamic Declaration on Global Climate Change issued by influential Islamic theologians on August 18, 2015, ahead of the Paris Conference, that stated the world's 1.6 billion Muslims and Muslim majority governments have the religious duty to reduce greenhouse gas emissions.²¹

At previous environmental conferences, other participants accused Saudi Arabia of attempting to 'wreck' the summit to protect its hydrocarbon exporter status.²²

Before the Paris Conference, however, Saudi Arabia had submitted an INDC that pledged to achieve mitigation co-benefits of up to 130 million tons of carbon dioxide equivalent a year by 2030.²³ Yet, as discussed below in Section 4.1, the Saudi pledge contained numerous caveats.²⁴ Saudi Arabia not only failed to provide figures or forecasts of future emissions growth, but it also stressed that its plans to deploy renewable energy and implement its energy efficiency goals depend upon strong economic growth from oil exports.²⁵ During the negotiations, Saudi Arabia opposed any mention of 1.5 degrees Celsius as the more ambitious global warming target temperature and objected to 2050 being the decarbonization target date for its economy. Other negotiators criticized Saudi Arabia's opposition to periodic reviews of its greenhouse gas reduction plans. The Saudi negotiator simply stated that 'it is unacceptable for developing countries, like my own, to be asked to participate in this so-called ratchet mechanism.'²⁶

A Saudi delegate also stated that his country did not have the administrative structure to adhere to specific provisions requiring updating figures and forecasts. Instead, he pled, 'we developing countries don't have the capacity to do this every five years. We are too poor, we have too many other priorities. It's unacceptable.'²⁷ Furthermore, Saudi Arabia insisted that only developed countries should contribute to the Green Climate Fund.²⁸ Moreover, the Saudi delegation argued that if the Loss and Damage mechanism were to compensate small island states, Saudi Arabia should also be protected from the loss of future oil revenue by receiving financial aid to invest in renewable energy technology.²⁹ While many of these positions were not new, the standard negotiating position of even some of Saudi Arabia's closest conference allies diverged from its position (and negotiating style) starkly.³⁰

However, Saudi Arabia's role during the Paris Conference somewhat obscures the significant fact that Saudi Arabia, while objecting to several ambitious stipulations in the Agreement, ultimately agreed to the central premise that action must be taken to combat global warming. This fundamental reconfiguration of the Saudi position is illustrated by the announcement of the former Saudi Oil Minister, Ali Al-Naimi, in May 2015, when he declared, 'in Saudi Arabia, we recognize that eventually, one of these days, we are not going to need fossil fuels.'

I don't know when, in 2040, 2050, or after that,³¹ Saudi Arabia's newfound perspective on climate change contrasted with the position of the Trump

21 While this declaration holds neither legal nor political power to compel countries nor individuals, it does illustrate the changes occurring in the Islamic world as it relates to environmental issues. And this is part of a general trend of the major global religions taking a theological stance that an important aspect of human stewardship of the earth is to mitigate climate change. Pope Francis published a papal encyclical letter that declared the science behind climate change was clear and that the world's 1.2 billion Catholics have a moral duty to protect the environment from global warming. See, 'The Islamic Declaration on Global Climate Change' <<http://www.ifees.org.uk/declaration/>>; Encyclical Letter, Laudato Si of the Holy Father Francis on Care for Our Common Home, Libreria Editrice Vaticana (May 24, 2015).

22 Suzanne Goldenberg, 'Saudi Arabia Accused of Trying to Wreck Paris Climate Deal' *The Guardian* (London, December 8, 2015).

23 The Intended Nationally Determined Contribution of the Kingdom of Saudi Arabia Under the UNFCCC <<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Saudi%20Arabia/1/KSA-INDCs%20English.pdf>>

24 For instance, it was also the last G20 country to submit its INDC ahead of the Paris Conference.

25 Alex Pashley, 'Saudi Arabia Submits Climate Pledge to UN Deal' *The Guardian* (London, 10 November 2015); (n 24).

26 (n 26).

27 Saudi Arabia currently ranks as the world's fifteenth largest economy; (n 26).

28 *ibid.*

29 *ibid.*

30 Saudi Arabia's insistence on its position also caused some discord with other Arab League members. Egypt has officially supported the 1.5-degree Celsius target at the onset of negotiations, while Morocco, was the first Arab country to submit its INDC, and as one of the region's most proactive Arab nation on climate change issues hosted the 2016 Marrakesh Climate Change Conference. And Jordan, Morocco, and Tunisia submitted INDCs that are more progressive than Saudi Arabia's. However, as a bloc, due to Saudi Arabia's influence in the organization, the Arab League was the only group opposing the 1.5 degrees Celsius target. Many Arab countries are wary of dissenting from the Saudi position as they often depend upon the Kingdom for political stability in the region and intermittent aid infusions when they have economic crises. The issues of regional political security and foreign aid became even more critical after the Arab Spring in 2011.

31 Pilita Clark, 'Kingdom Built on Oil Foresees Fossil Fuel Phase-Out This Century' *Financial Times* (London, 21 May, 2015)

Administration, which sought to increase fossil-fuel exports and withdraw from the Paris Agreement. And Saudi Arabia, the most influential OPEC member, led the organization to embrace the Paris Agreement in February 2016.³² Utilizing highly nuanced language, a Saudi delegate noted that ‘we need to recognize that the climate issue is a global issue. This process is resilient enough to move forward....’³³ Suffice it to say, Saudi Arabia will follow the prevailing trends and would be extremely unlikely to withdraw from the Agreement.

During the Paris negotiations, the UAE and Qatar proved to be much more flexible and ambitious in their negotiating positions than the Saudis. For instance, ahead of the Paris conference, the UAE, while tardy, submitted one of the more ambitious INDCs, which seeks to reduce carbon emissions by generating 24% of its power from renewable and nuclear energy by 2021.³⁴ And, before the conference, the Emirati director of energy and climate change at the Ministry of Foreign Affairs announced that ‘the UAE is prepared to work with other nations to combat climate change.’³⁵ He stressed that ‘the UAE is fully committed to the negotiation process...and...we firmly believe that through global partnership and domestic policy, we can overcome climate challenges and turn them into opportunities to build a more diversified and sustained economy.’³⁶

The difference in opinion between Saudi Arabia and the UAE relates to how each country views the potential impact of the global effort to decarbonize. For instance, Saudi Arabia, until recently, regarded any movement to reduce global carbon emissions as damaging to its economy. As a significant oil exporter, the UAE viewed decarbonization similarly during previous negotiations. Subsequently, it recognized that it could leverage prevailing global trends to restructure its economy and aid its diversification efforts in fundamental ways. Therefore, while the UAE would still desire to benefit from the fossil-fuel economy for as long as possible, it recognizes the inherent benefits that it could acquire from becoming a first mover.³⁷

Qatar, which has one of the highest per capita carbon emissions globally, reaching nearly 50 metric tons per person, diverged from both the UAE and Saudi Arabia. This divergence was a particularly contentious issue for many attendees. As mentioned previously, Qatar tended to have a quietist perspective during climate negotiations and allowed Saudi Ara-

bia to set the general tone as the lead Arab negotiator. However, after having hosted CoP 18 in 2012, Qatar has become one of the most proactive countries in bringing climate change issues to the forefront of Arab consciousness.

Much like the UAE, Qatar recognizes how much it stands to benefit (being the world’s largest producer of LNG and third largest holder of conventional natural gas) from global decarbonization because natural gas is positioned to be a transition fuel while the world moves away from coal and oil.³⁸ At the same time, Qatar recognises its extreme vulnerability to climate change. A sea-level rise of less than five meters would flood 18.2 % of its land area.³⁹ This scenario would have a disastrous impact on Qatar as 96 % of its population lives in coastal areas.⁴⁰ Given the shallow depths of its marine waters, even relatively slight temperature increases would have a disproportionate impact. Recent studies have also concluded that by 2100, many areas of the Gulf could become intolerable for human life because of higher temperature levels.⁴¹

Therefore, the prospects of economic benefits and apprehensiveness regarding ecological catastrophe led Qatar to take a non-antagonistic stance toward global decarbonization efforts. When Qatar submit-

32 OPEC Bulletin, ‘The Organization of Petroleum Exporting Countries’ (2016) 2.

33 (n 32).

34 The UAE submitted its INDC on October 22, 2015. Intended Nationally Determined Contribution of the United Arab Emirates, United Nations Framework Convention on Climate Change (Oct. 22, 2015) 2. Available at <<http://www4.unfccc.int/ndcregistry/PublishedDocuments/United%20Arab%20Emirates%20First/UAE%20INDC%20-%202022%20October.pdf>>

35 Naser Al Wasmi, ‘UAE’s Environment Goals Set Out Ahead of Crucial Paris Conference’ (2015) *The National*.

36 *ibid*.

37 Jo Lo, ‘UAE Sets Net-Zero By 2050 Target, Promises Renewable Investments’ (2021) *Climate Change News*.

38 A bridge fuel is a low carbon-intensive energy source that can be utilized instead of coal or oil that will allow the world time to develop/deploy other reduced or non-carbon energy alternatives. For a cogent discussion of the role of natural gas as a bridge fuel, see, Steve Weissman et al, ‘Natural Gas as a Bridge Fuel’ (2016) *Center for Sustainable Energy*.

39 Abdulhadi Nasser Almarri, ‘Climate Change in Qatar’ (2016) 4 *QScience Proceedings* 4.

40 Owen Mulhern, ‘Sea Level Rise Projection Map-Qatar and Bahrain’ (2020) <https://earth.org/data_visualization/sea-level-rise-by-2100-qatar-and-bahrain/> accessed 1 December 2021.

41 Jeremy Pal and Elfatih A. B. Eltahir, ‘Future Temperature in Southwest Asia Projected to Exceed a Threshold for Human Adaptability’ (2016) *Nature Climate Change* 6, 197-200.

ted its pledge to CoP 21, it stated that ‘Due to Qatar’s dependence on the export of oil and gas, there is an uncertainty from the potential impact of the implementation of response measures to climate change that may negatively impact the strength of Qatar’s economy and potentially the quality of life of its residents.’⁴² As discussed in Section IV.3, Qatar’s INDC did not contain any firm targets. Still, it highlighted that it is in the process of deploying its available resources to achieve energy efficiency and is, therefore, investing substantial sums in other natural resources such as solar energy.

Qatar’s INDC disclosed that it has been contributing ‘indirectly to global efforts to mitigate climate change by exporting Liquefied Natural Gas as clean energy.’⁴³ Because the INDC lacked clear and defined carbon reduction targets, Brazilian Environment Minister, Izabella Teixeira, singled out Qatar and other wealthy developing countries for submitting INDCs that did not commit to an absolute carbon emissions reduction.⁴⁴ Nonetheless, this criticism does not negate the proactive stance that Qatar has had overall during the negotiations, which was a

stark departure from its earlier apparent lack of interest.

1. The Evolution of Burden Sharing and Historical Responsibility Outlook Amongst the Gulf Countries and OPEC

During the earlier multilateral climate negotiations, OPEC member states, led by Saudi Arabia, felt that the sessions lacked procedural and consequential equity. The reason for this is that the OPEC member states perceived an imbalance of scientific information, institutional capacities, financial assets, and human resources in the bargaining process as creating a lack of procedural equity.⁴⁵ And OPEC member states also felt that they were unfairly targeted in the global bid to mitigate climate change as their hydrocarbon-dependent economies would take on a perceived unfair burden.

The wealthy hydrocarbon-producing countries in the Gulf tended to have a contradictory position when they argued from a ‘developing country’ position. The wave of decolonization during the mid-twentieth century witnessed the emergence of a collective ‘Global South’ identity midwived through the political ideology known as Third-Worldism. This somewhat unwieldy philosophy failed to paper over the genuine differences that arose after colonialism and the rise of distinct (and sometimes conflicting) national interests in the developing world.⁴⁶

Notwithstanding, the G-77, of which the Gulf countries are members, agreed on several fundamental principles when it came to multilateral climate change negotiations. They maintained that climate change is predicted to be so severe as to likely overcome the ability of the relatively weak institutions in their member states to manage the outcomes. Additionally, most G-77 member states believe that developed countries have been principally responsible for the high carbon concentrations in the atmosphere since the industrial revolution. Therefore, the onus and the cost should be borne primarily by them based on the principles of ‘historical responsibility,’ ‘equity,’ and ‘climate justice.’⁴⁷

Indeed, this last principle of historical responsibility harkens back to a fundamental maxim in environmental law, i.e., the polluter-pays principle.⁴⁸ The essential elements of the polluter-pays lie at the heart

42 INDC Qatar, 6

43 INDC Qatar, 2

44 Alex Pashley, ‘Brazil Minister Calls Out Emerging Economies Over Weak Climate Pledges’ (2015) Climate Home News.

45 Luke Tomlinson, *Procedural Justice and Climate Change: Defining Who Should Be Included in Decision Making Processes of a Climate Change Negotiation* (University of Oxford Press, 2011); K Goran-Maler et al, ‘Equity and Social Considerations’ in J. P. Bruce et al (ed) *Economic and Social Dimensions of Climate Change: Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 1995).

46 Third-Worldism is a political ideology that emerged in the 1940s and 1950s that attempted to unify developing countries that did not join in common cause with either the United States nor the Soviet Union. The political ideologues of this concept argued that the actual issue of geopolitical importance in the world was not the East-West divide, but rather the North-South divide. The Gulf countries faced a somewhat precarious role during the late twentieth century, they were stalwart Western (principally American) allies, and firmly capitalistic, in a group that tended towards anti-Westernism and socialism. For a broad exposition on this theory, please see, Mark T Berger, Heloise Weber, *Rethinking the Third World: International Development and World Politics* (Palgrave Macmillan, 2014).

47 However, the UNFCCC has incorporated the notion of ‘common but differentiated responsibilities’ formalized in the United Nations Framework of Convention on Climate Change (UNFCCC) of the Earth Summit in Rio de Janeiro, 1992. The main issue with many developing countries is how wealthier nations interpret it within the context of carbon emissions reductions.

48 The Polluter-Pays principle was an organic part of the legal codes in the industrializing countries of the nineteenth century.

of the fundamental philosophical conflicts in international climate negotiations between developing oil-producing states and the developed West (See Table 2 in Annex for a detailed list of climate equity principles).

Even though OPEC member states eventually acquiesced to the Kyoto Protocol, which involved Qatar, Kuwait, the UAE, and Saudi Arabia pledging in 2007 to establish a USD750 million fund for advanced research into climate change, abiding concerns prompted several legal challenges from oil-producing states.⁴⁹ These concerns were related most specifically to Article 2.3, which calls upon Parties to minimize the impact of any policies and measures on ‘international trade...on other parties, especially developing country Parties...’⁵⁰

Article 3.14 of the Protocol forged a broad consensus between the OPEC member states and the developed world. More specifically, this article calls upon developed countries to ‘strive to implement’ their obligations to minimize adverse social, economic, and environmental impacts on developing country Parties, especially those specified in Article 4.8.⁵¹ The high hydrocarbon demand rates in Annex One countries were critical for OPEC because these countries formed the highest group of consumers for OPEC’s output at the time of negotiations.⁵²

Many of the impasses were overcome in the Bonn Agreement and the following Marrakesh Accord to the UNFCCC at COP-7.⁵³ The members of the UNFCCC agreed upon the creation of a special climate

change fund, aid for least developed countries to assist in adapting to climate change impacts, limiting the growth of their carbon emissions, and acquiring renewable energy technology.⁵⁴ Additionally, Article 3.14 of the Marrakesh Accords required that, during the implementation process of the Kyoto Protocol, developed countries produce annual information on what action they are taking to reduce adverse social, environmental, and economic impacts on developing countries.⁵⁵

III. COP 26: The Establishment of Enhanced Frameworks

In order to strengthen the agreements made in Paris, the world came together again in Glasgow for COP 26. Ministers from all over the world agreed that firmer efforts should be made to submit more robust 2030 emissions reduction targets to close the gap to limiting global warming to 1.5 degrees Celsius.⁵⁶

Adaptation figured high on the program as ministers also agreed that developed countries should funnel more resources to assist developed countries more at risk to extreme climatic events to adapt to the changing world, which could witness ever-increasing devastating storms, lower crop yields droughts, and population dislocation.

Many environmentalist groups questioned the legitimacy of COP 26 for what was perceived as being unduly restricted participation by observers repre-

49 The opening of the OPEC Summit in Riyadh announced the creation of this fund in November 2007. The purpose of this fund was to focus research upon carbon capture and storage and the development of clean oil technology; *OPEC*, ‘OPEC Annual Report 2007’ (2008) 49.

50 For instance, Saudi Arabia challenged OECD climate policies at the WTO’s Committees on Trade and Environment and the Non-Agricultural Market Access Negotiating Group. WTO, ‘Energy taxation, Subsidies, and Incentives in OECD Countries and their Economic and Trade Implications on Developing Countries, in Particular Developing Oil Producing and Exporting Countries’ (2002).

51 *ibid.*

52 Oil demand in industrialized countries peaked in 2005, reaching approximately 50 million barrels per day. Due to changing demographics and increasing automobile fuel efficiency standards, OECD oil demand will not likely reach that level again; Thomas Helbing et al., ‘Oil Scarcity, Growth and Global Imbalances’ (2011) International Monetary Fund.

53 The Marrakesh Accord formalized an agreement on the operational rules for global emissions trading, the Clean Development

Mechanism, and Joint Implementation, as well as creating a compliance regime and specific accounting procedures; Jon Barnett and Suraje Dessai ‘Articles 4.8/4.9 of the UNFCCC: The Adverse Effects and the Impacts of Response Measures’ (2002) 2 Climate Policy 3, 231–239; Suraje Dessai, ‘The Climate Regime from The Hague to Marrakech: Saving or Sinking the Kyoto Protocol?’ (2001) Tyndall Centre Working Paper No. 12, 231–239.

54 UN, ‘Governments Adopt Bonn Agreement on Kyoto Protocol Rules’ (2001).

55 Saudi Arabia considered this a significant feat. However, Saudi Arabia also desired that this information be placed under the purview of the enforcement branch of the compliance committee. This did not occur due to developed country resistance, and instead fell under the mandate of the facilitative branch; UNFCCC, ‘The Marrakesh Accords and the Marrakesh Declaration’ (2001) <http://unfccc.int/cop7/documents/accords_draft.pdf> accessed 1 December 2021.

56 In the COP 26 decision, it states that countries, resolve to pursue efforts to limit the temperature increase to 1.5 degrees C.’ As a result, this gives much greater focus on the lower temperature threshold than even the Paris Agreement.

senting hundreds of environmental, academic, indigenous, women's rights, and climate justice groups.⁵⁷ However, that does not negate the fact that some successes arose from the negotiations, which made progress in many areas.

At the conclusion of COP 26, 151 countries had submitted updated NDCs to further trim their carbon emissions by 2030. However, the UN analyzed the NDCs and calculated that if these plans are collectively adopted as is, then the world temperature will increase by 2.5 degrees Celsius.⁵⁸

A number of countries announced fresh net-zero emissions commitments to be reached around mid-century, including Saudi Arabia and the UAE, as discussed in Section 4.0. Yet, many environmental groups consider that some of the major emitters have undefined 2030 targets, resulting in unclear pathways to achieve their net-zero targets.⁵⁹ As a result, the Glasgow decision calls upon countries to 'revisit and strengthen' their 2030 targets by the end of 2022 to further align them with the Paris Agreement's temperature increase targets.⁶⁰ The COP26 decision also requested that countries submit long-term strategies to 2050, which would help facilitate a low-carbon transition by mid-century.

Additionally, the COP26 decision requested that countries consider implementing policies to reduce other greenhouse gases, such as methane, and intro-

duced language to 'phase down unabated coal' and 'phase-out fossil fuel subsidies.'⁶¹ Therefore, while it is widely considered that more work has to be done, Glasgow did set the groundwork for the collective decarbonization momentum. OPEC Secretary-General, Mohammad Barkindo, dubbed these talks a 'wake-up call' because even though the global oil and gas industry did not suffer any significant disruption from specific pledges-as there were no decisive plans to phase out hydrocarbons-the talks did formally set the hydrocarbon industry in its sights as needing to be focused upon.⁶²

In addition to its language to phase down coal and phase out hydrocarbon subsidies, COP26 also seemed to serve as a harbinger of a post-oil world with the establishment of the first country-led effort to accelerate the global shift away from oil and gas production/consumption to low-carbon energy. The Beyond Oil and Gas Alliance, unveiled by the governments of Costa Rica and Denmark, seeks to drive an equitable global transition from fossil fuels to achieve the Paris Agreement goals of limiting global temperature rise to 1.5 degrees Celsius.⁶³ The establishment of the Beyond Oil and Gas Alliance signaled a conceptual shift in international climate negotiations, which sought to move the conversation away from merely focusing on GHG emissions to assessing the sources of those emissions, such as oil, gas, and coal.⁶⁴

Meanwhile, the Gulf countries attempted to influence the language that would be more amenable to their macroeconomic postures. The Gulf countries, joined by other major developing economies, intervened to soften the language to change the proposed wording of 'phasing out' of unabated coal power' to the more flexible term, 'phasing down.' The US and EU backed the incorporation of language phasing out fossil-fuel subsidies and coal-fired power, but many major hydrocarbon producers resisted it. Additionally, countries like South Africa and Nigeria, which significantly rely upon coal and oil consumption, objected to a non-nuanced rejection of fossil-fuel subsidies.⁶⁵

But, it is not lost on the major hydrocarbon producing countries that there is likely to be more significant pressure placed on them and their primary exports throughout this decade as the International Energy Agency (IEA) predicts that global oil demand would need to start declining immediately to reach the 1.5 degrees Celsius target, and must collapse by

57 Nina Lakhani, 'COP26 Legitimacy Questioned as Groups Excluded from Critical Talks' *The Guardian* (London, 8 November 2021).

58 This increase is considered much better than the 4 degrees Celsius track that the world was headed on prior to the Paris Agreement, but climatologists still consider this increase significantly dangerous; World Resources Institute, 'COP26: Key Outcomes from the UN Climate Talks in Glasgow' (2021).

59 *ibid.*

60 *ibid.*; UN, 'COP26 Keeps 1.5 C Alive and Finalises the Paris Agreement' (2021) UN Climate Change Conference UK 2021.

61 This was the first time in international climate negotiations that negotiators included direct language to transition away from coal and phasing out hydrocarbon subsidies.

62 Robert Perkins, 'COP26 Cranks Up Pressure on Oil, Gas Despite Dodging Closer Scrutiny' (2021) S&P Global Platts.

63 Additionally, the alliance counts France, Greenland, Ireland, Sweden, Wales and the Canadian province of Quebec as full members, and California and New Zealand are associate members. Together, the group accounts for .8 percent of global oil production. Italy announced itself as a 'friend' of the organization as well.

64 The Paris Agreement does not bear any mention of fossil fuels, which, collectively, are responsible for approximately 90% of anthropogenic carbon emissions.

65 *ibid.*

75% over the next three decades, for the world to be on a secure pathway to net-zero emissions by 2050.⁶⁶

OPEC entered the negotiations arguing that global GHG emissions could be slashed without hard limits on oil and gas production. The Saudi Arabian Energy Minister, Prince Abdulaziz bin Salman Al-Saud stated that, ‘it is imperative that we recognize the diversity of climate solutions, and the importance of emissions ... without any bias towards or against any particular source of energy’.⁶⁷

The positions of the Gulf countries, led by Saudi Arabia, promoted the notion that carbon capture and sequestration technology holds the promise of allowing continued hydrocarbon consumption without unduly penalizing hydrocarbon at the expense of other fuel sources. However, many climate activists argued that promoting such technology is not a viable means of reducing carbon emissions because the technology is expensive, not yet scalable, and would only allow carbon-intensive industries to continue operating without restriction.⁶⁸

Fundamentally, for the Gulf countries, what the argument boiled down to was an appeal for economic self-interest, in the sense that an abrupt shift away from oil and gas will shut off the majority of the energy mix without any comparable energy source to rapidly take its place. And, as a corollary to the argument, the Gulf countries put forth the position that if such a move were to be made, it would cause immense spikes in energy prices. They argued that if this were to occur, not only would it retard the tenuous global economic recovery taking place in the wake of the pandemic but would also negatively impact consumers in developed countries.⁶⁹

Yet, although the Gulf countries continued support for hydrocarbon production during the negotiations, the UAE and Saudi Arabia announced, somewhat surprisingly, prior to the meeting in Glasgow, that they would implement net-zero targets. Saudi Arabia plans to achieve it by 2060, while the UAE pledged to reach net-zero by 2050. However, these announcements did not come with any detailed plans.

IV. Analysis of the Nationally Determined Contributions of Saudi Arabia, the UAE, and Qatar

The NDCs of Saudi Arabia, Qatar, and the UAE have mostly been criticized for indicating a reliance, albeit

a somewhat declining dependency, upon fossil-fuel exports for the long term.

The World Resources Institute has outlined three characteristics that would create a firm and robust foundation for an NDC, i.e., it must be ambitious, transparent, and equitable (See Table 3 in Annex).⁷⁰

The subsections below will assess each of the three countries' NDCs according to these criteria.

When evaluating NDCs, there is a wide variance in submissions between developing and developed countries, considering both the coverage and scope of mitigation policies. Developed countries tend to state their contributions as a quantified macro-economic mitigation effort reported against a baseline year.⁷¹ Developing countries, by contrast, generally create their climate pledges by utilizing carbon intensity or describing their reduction target against a business-as-usual scenario. Therefore, NDCs can either be constructed as a means or as desired outcomes.

Saudi Arabia, Qatar, and the UAE crafted their NDCs to follow the mitigation co-benefits model, which bases emission reduction on a nation's ability to reconfigure their respective macro-economies. Overall, the NDCs of the three countries are not significantly robust regarding quantifiable data on which to calculate future greenhouse gas emissions reductions.

The NDCs of the three selected countries will be assessed according to the text without significantly comparing them against their undocumented carbon mitigation plans. With the above, it will be determined whether the three selected countries have and are in the process of making verifiable gains in achieving their respective NDCs and making progress in reducing carbon emissions and the implementation of decarbonization policies.

It is expected that by 2022, as requested by the COP26 decision, Saudi Arabia, Qatar, and the UAE will submit far more robust documents that track

66 *ibid*; See, generally, International Energy Agency, ‘Net-Zero by 2050: A Roadmap for the Global Energy Sector’ (2021).

67 Shadia Nasralla, ‘OPEC Makes Case for Fossil Fuels at UN Climate Conference’ (2021) Reuters.

68 *ibid*.

69 *ibid*.

70 See, Kelly Levin et al, ‘Designing and Preparing Intended Nationally Determined Contributions’ (2015) World Resource Institute.

71 Climate Observer, ‘Assessing the INDCs: A comparison of Different Approaches’ (2016).

their national vision statements (national macro-economic diversification and renewable energy plans).

1. The Saudi Arabian NDCs

Many observers were somewhat astounded when Saudi Arabia submitted its climate pledges ahead of COP 21 (See Table 4 in Annex).⁷² Saudi Arabia's pledge essentially revealed that one of the world's largest oil-producing countries agreed to reduce greenhouse gas emissions by approximately 130 million tons of carbon dioxide equivalent by 2030 through policies that would have the co-benefits of economic diversification and greenhouse gas emissions mitigation.⁷³ Prior to the COP26, Saudi Arabia submitted its updated NDC on October 23, 2021 (See Table 5 in Annex).

The Saudi submissions heralded a fundamental evolution in Saudi Arabia's core position on climate change. However, for other observers, Saudi Arabia's submission was an overly aspirational document that, while not obstructionist, was undoubtedly not substantial.⁷⁴ Saudi Arabia's NDC, as stated previously, highlights the Kingdom's strong dependence on the oil sector. As discussed below, the 2015 NDC set a target of emissions reductions of up to 130 MtCO₂e, that many considered inadequate to meet the goal of keeping the global temperature rise below 1.5 degrees Celsius. In its updated NDC, Saudi

Arabia increased its 2030 emissions target to 278 MtCO₂e.

But even assessing the progress to meet this goal has been exceedingly difficult as the government had neither published any official projections of its emissions nor defined the business-as-usual baseline against which progress is to be assessed. Due to the uncertainty of the NDC targets and the lack of available data, it is not yet possible to determine whether Saudi Arabia is on track to meet its goals.⁷⁵ Furthermore, as Krane stated, Saudi Arabia, somewhat paradoxically, finds itself in a multitude of positions; it is a major hydrocarbon producer, exporter, hydrocarbon subsidizer, and consumer.⁷⁶ Additionally, it finds itself significantly at risk to the threat of climate change.

Therefore, this illustrates two potential future scenarios. The first scenario (Scenario 1) delineates an environment in which oil-based revenue is utilized to diversify the country away from dependence on oil exports and funnel revenue into renewable energy and the downstream hydrocarbon and value-added sectors.⁷⁷ The second scenario (Scenario 2) outlines a path whereby Saudi Arabia intends to utilize its hydrocarbon wealth to industrialize sustainably.⁷⁸

And Krane furthermore illustrated two other potential pathways that Saudi Arabia could implement in multilateral negotiations, in that there would be a cooperative path, which would see the major oil producers coordinate policies so that international oil prices remain above the cost of production. Secondly, there could be the development of a more 'hostile' dynamic, in which hydrocarbon-producing countries would attempt to leverage their positions against countries that are committed to decarbonizing. As Krane wrote, this 'second pathway might be accompanied by a 'green paradox' conundrum, where low-cost producers maintain or even ramp up production, driving down oil prices and helping fossil fuels compete against alternatives.⁷⁹ The preceding may already be occurring as Saudi Aramco announced in October 2021, prior to the Glasgow conference, that it will increase its oil production capacity to 13 million barrels per day by 2027.⁸⁰

However, it must be put in the context of the massive increases in Saudi Arabia's primary energy consumption that, as Wogan indicated, increased by a compound annual growth rate of 4.6 % between 1990-2014 (more than double the 1.9 % of the global

72 Craig Welch, 'The Good, the Bad, the Bewildering: 10 Countries' Climate Pledges' (2015) National Geographic (2015).

73 Saudi Arabia INDC, 7.

74 For instance, Climate Action Tracker considers Saudi Arabia's INDC as 'inadequate'; Climate Action Tracker, 'The Paradox of Saudi Arabia's Climate Plans' (2015).

75 See, Michel Den Elzen et al, 'Are the G20 Economies Making Enough Progress to Meet their NDC Targets?' (2019) Energy Policy 126, 244.

76 Jim Krane, 'Climate Strategy for Producer Countries: The Case of Saudi Arabia' in (ed) Giacomo Luciani and Tom Moerenhout, *When Can Oil Economies Be Deemed Sustainable?* (Palgrave Macmillan 2021) 302-3.

77 Saudi Arabia INDC, 2.

78 Saudi Arabia INDC, 1.

79 Jim Krane, *Climate Strategy for Producer Countries: The Case of Saudi Arabia* (Springer, 2020) 302; See, generally, Aisha Al-Sarihi, 'Climate Change and Economic Diversification in Saudi Arabia: Integrity, Challenges and Opportunities' (2019) The Arab Gulf States Institute in Washington; Joanna Depledge, 'Striving for No: Saudi Arabia and the Climate Change Regime' (2008) 8 Global Environmental Politics: The MIT Press, 4.

80 Offshore Technology, 'Saudi Aramco Commits to Reach 13 MMbpd Capacity by 2027' (2021).

average in 2017).⁸¹ As a result, Saudi Arabian total carbon emissions grew three-fold, from 200 million tons in 1990 to approximately 600 million tons in 2014. Most of these gains were led by the manufacturing and industrial sectors.⁸²

Saudi Arabia intends to create a baseline for carbon emissions reductions as an amalgam of both Scenario 1 and 2. The basic premise of the NDC is that Saudi Arabia expects to continue to consume, produce and export a high level of hydrocarbons for the mid-to-long term. The NDC's focus outlines how the Saudi drive for economic diversification would have mitigation co-benefits in carbon emissions reduction. To summarize, according to the Saudi NDC, Saudi Arabia does not intend to implement carbon emissions reduction policies for the near term directly; rather, the carbon reduction would inhere from the significant investments made in renewable energy. Instead, it reasons that carbon emissions reductions are a byproduct of the principal national economic diversification strategy.⁸³

It is noteworthy that Saudi Arabia is not attempting to limit carbon emissions beyond what 'could' result from economic diversification efforts. However, some of the mitigation co-benefits, such as transitioning from oil to natural gas in the power sector and increasing gasoline/power tariffs, are already having an impact as Saudi Arabia increased industrial power tariffs and gasoline prices by approximately 50% in 2015.⁸⁴ And, at the start of January 2018, prices rose a further 80%.⁸⁵ After price reforms, domestic crude oil demand declined approximately 3.5 % (to 2.21 million barrels per day) year-on-year in December 2016, as compared to the same period in 2015.⁸⁶

Even though Saudi Arabia's abatement goal does not depend upon acquiring international financial support from developed countries, it is conditional to the extent that it depends upon continued economic growth and a 'robust contribution from oil exports revenues to the national economy.'⁸⁷ Saudi Arabia also premised its carbon reduction obligation upon the fact that '...the economic and social consequences of international climate change policies and measures do not pose a disproportionate or abnormal burden on the Kingdom's economy.'⁸⁸ At the same time, Saudi Arabia announced that it would produce 9.5 gigawatts of power from alternative energy sources (installed capacity), comprising approximately 60 projects by 2023.⁸⁹

At the centerpiece of Saudi Arabia's decarbonization policy is the circular carbon economy (CCE) approach (See Figure 1). Championed by Saudi Arabia during its presidency of the G20, in 2020, the leaders of the G20 endorsed the CCE as a viable method to promote economic growth and manage emissions in all economic sectors.⁹⁰ As outlined in Saudi Arabia's NDC, the CCE focuses on developing a closed-loop system utilizing the 4Rs: reduce, reuse, recycle and remove (See Annex).⁹¹ The remove aspect delineates the removal of carbon both at the combustion stage and directly from the atmosphere. Even though other technologies are currently being studied, the edifice upon which CCE rests is carbon capture use/storage (CCUS). Yet, while CCUS plays a prominent role in nearly all of the Paris Agreement compatible pathways, it is still criticized for being cost-prohibitive and unscalable (at the present moment) and for continuing the use of carbon-intensive fuel sources.⁹² The Saudi goal lies in distinct contrast to the increasingly targeted goal of international climate negotiations to focus on emissions reductions and remove hydrocarbon's central role in the global economy.

81 David Wogan et al, 'Policy Pathways to Meet Saudi Arabia's Contributions to the Paris Agreement' (2019) KAPSARC, 9.

82 *ibid.*

83 Climate Tracker stated that if all countries were to follow Saudi Arabia's approach of economic diversification co-benefits to abate 130 MtCO₂e, then the global temperature increase would exceed 4°C. Available at <<http://climateactiontracker.org/countries/saudi-arabia.html>>

84 The 2015 price increase increased the price of 95 octane gasoline to 0.90 riyals (\$0.24) per liter from 0.60 riyals. The government plans more incremental increases until 2023 when domestic gasoline prices should conform to international levels. Wael Mahdi and Vivian Nereim, 'Saudi Arabia Plans to Raise Prices by 80 Percent in January' (2017) Bloomberg.

85 *ibid.*

86 BP 2016.

87 Saudi Arabia NDC, 10.

88 Saudi Arabia's NDC does point out that its carbon reduction obligation is consistent with Art 3 para 2 and Art 4 para 8(h) and 10 of the United Nations Framework Convention on Climate Change.

89 The projects would cost between \$30-50 billion. In August 2017, the Saudi government announced that it would exceed its target that required that 9.5 gigawatts of power to be produced from renewable energy sources by 2023. The Saudi officials indicated that further details would be announced at a later date; Reuters Staff, 'Saudi Arabia Intends to Exceed Renewable Energy Target' (2017) CNBC.

90 Chatam House, 'G20 Endorses a Circular Carbon Economy: But Do We Need It?' (2020).

91 Saudi Arabia NDC, 8.

92 IPCC, 'Special Report: Global Warming of 1.5 °C' <<https://www.ipcc.ch/sr15/>> accessed 1 December 2021.

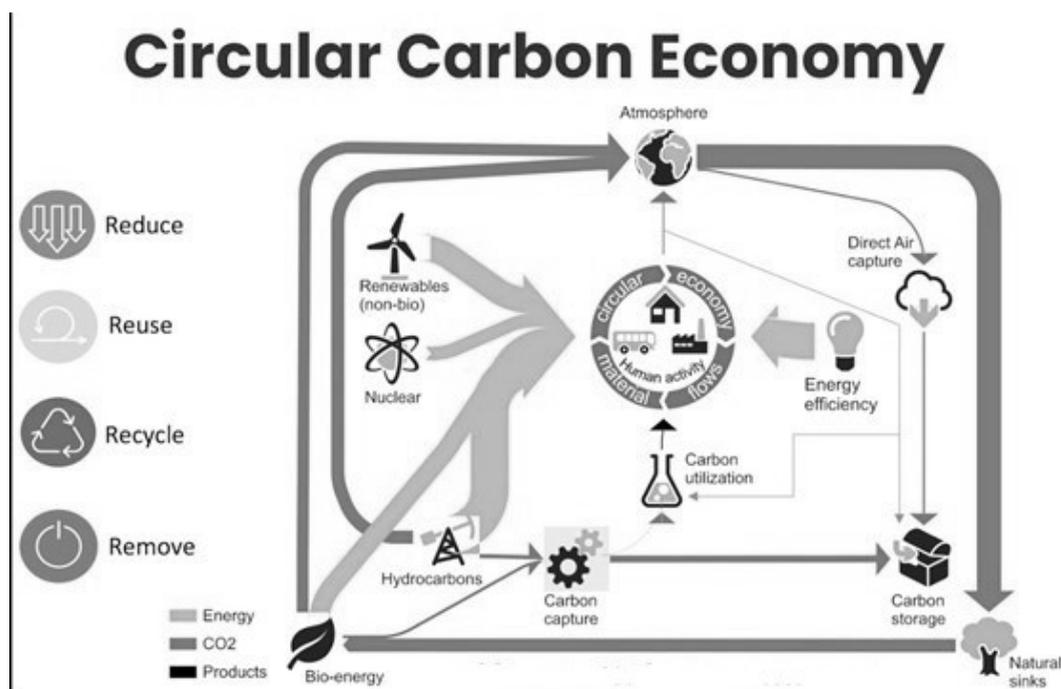


Figure 1: Representation of the Circular Carbon Economy

Saudi Arabia's NDC stresses that substantial amounts of investment would be required to diversify a hydrocarbon-dependent economy away from its export model should the world decarbonize in earnest. Beyond that, if successfully implemented, this diversification could have many mitigation co-benefits.

a. Is the Saudi NDC Equitable, Transparent and Ambitious?

Using the methodological criteria outlined in Section 4.0 to analyze the robustness of NDCs, Saudi Arabia's NDC provides a transparent approach, but only to an extent as it lacks certain critical factors. The Saudi NDC presents comprehensive descriptions of each mitigation co-benefits of their proposed economic diversification exertions. Energy efficiency and the transportation sector are outlined as especially critical priorities in Saudi Arabia's NDC. This may be ex-

pected given that Saudi Arabia, with nearly 30 million inhabitants, is the seventh-largest global consumer of refined petroleum products.⁹³ However, Saudi Arabia did not publish a business-as-usual range for its NDC targets. The Saudi NDC states that a 'dynamic baseline' will be developed from a combination of two scenarios,' i.e., whether a greater amount of petroleum is domestically consumed or whether it is exported.⁹⁴

Moreover, the Saudi NDC is vague as to whether the Saudi government intends to place oil production within the category of domestic consumption or within the export framework, each of which might affect greenhouse gas emissions projections in numerous ways. The NDC indicates that greenhouse gas emissions would be low in a 'high export' scenario, along with higher economic growth. This would be compared or contrasted to a scenario with higher domestic oil consumption. The targets in the NDC are conditioned upon a high export scenario because Saudi Arabia is allowed under the treaty to modify its NDC if its oil-based foreign revenue were to decline.

Due to this, there is significant opaqueness surrounding Saudi Arabia's intended greenhouse gas emissions target. Therefore, the level of transparen-

93 For the broad aspects of Saudi Arabia's domestic energy consumption see Glada Lahn and Paul Stevens, 'Burning Oil to Keep Cool: The Hidden Energy Crisis in Saudi Arabia' (2021) Chatham House.

94 Saudi Arabia INDC, 1.

cy regarding Saudi Arabia's NDC is 'low-medium.' Furthermore, Saudi Arabia's NDC may not be 'equitable' because if all countries followed the Saudi climate commitment in 2030, the global temperature increase would likely be above 4 degrees Celsius. Therefore, Saudi Arabia's approach may be neither 'fair' nor 'equitable' considering the Paris Agreement's long-term goal of keeping global temperature below a 2 degrees Celsius increase, let alone the more aspirational goal of the 1.5 degrees Celsius limit.

And, lastly, whether Saudi Arabia's NDC is 'ambitious,' it appears that under its current policy projections based on its NDC and other stated national policies, an observer could expect Saudi Arabia to experience an increase of carbon emissions from its 1990 levels. While Saudi Arabia, as the world's foremost oil exporter, undertook a significant step to sign and ratify the Paris Agreement, it is currently undergoing a broad-based macro-economic reconfiguration that is impacting every facet of its economy.

Therefore, Saudi Arabia has a vested interest in reducing its carbon intensity because a decline in carbon/energy intensity reflects a reduction in domestic energy consumption. Additionally, in October of 2019, Saudi Arabia announced that it would launch a carbon trading platform.⁹⁵ The Covid-19 pandemic has stalled those plans, and as of the time of writing, the Saudi government is still behind many other countries and has released no details on how low the carbon cap would be and how many credits it would release to corporations, as well as any additional guidelines for the carbon trading system.

And, before COP26 in Glasgow, in October, Saudi Arabia announced that it would commit to achieving net-zero GHG emissions in 2060.⁹⁶ However, even though this announcement was greeted with praise from most quarters, details were lacking. It was pointed out that the Saudi net-zero pledge only aims to reduce GHG emissions within its own jurisdiction while ramping up oil production for export. As the Saudi government stated, its transition to net-zero carbon emissions 'will be delivered in a manner that preserves the kingdom's leading role in enhancing the security and stability of global energy markets.'⁹⁷

More could be done, but considering the conceptual shift from its status as the world's foremost oil exporter to accepting that it must reduce its carbon emissions, Saudi Arabia's NDC could be considered moderately ambitious, at least in its stated goals.

However, much verifiable work would still need to be done.

2. United Arab Emirates NDC

Because the UAE submitted its INDC on October 22, 2015, and ratified the Paris Agreement on September 21, 2016, its INDC became its NDC (See Table 6 Annex).⁹⁸ And in December 2020, the UAE submitted its updated NDC (See Table 7 Annex).

Much like Saudi Arabia, the UAE's greenhouse gas emissions reductions plans are based upon economic diversification that will yield mitigation and adaptation co-benefits.⁹⁹

The UAE announced its net-zero goal by 2050 in October 2021 as a component of its UAE Net Zero 2050 Strategic Initiative.¹⁰⁰ The UAE became the first country in the Middle East and Northern Africa (MENA) region to set a net-zero target. But, as of yet, there is still a significant lack of details concerning its targeted sectors, transparency, and scope. As a result, its emissions coverage remains uncertain and unclear. As of December 2021, the UAE had not submitted a long-term strategic implementation plan to the UNFCCC.¹⁰¹ There is no GHG emissions mitigation target in the Emirati 2017-2050 National Climate Plan, and it only offers long-term abatement actions in the power sector.¹⁰² However, to a certain degree, this illustrates the lack of congruence between the Emirati NDC and domestic decarbonization policies as the updated 2020 NDC outlines a 2030 emissions

95 Rania El Gamal, 'Saudi Arabia Plans to Launch Carbon Trading Scheme' (2019) Reuters.

96 Associated Press, 'Saudi Arabia Pledges Net-Zero Greenhouse Gas Emissions by 2060' (2021) NPR.

97 *ibid.*

98 The Emirati INDC entered into force on November 6, 2016. *The UAE Ratifies the Paris Climate Agreement*, Gulf News (Sept. 22, 2016). Sources: UAE INDC (2016) and Climate Action Tracker <http://climateactiontracker.org/countries/uae.html>

99 UAE INDC, 1.

100 Permanent Mission of the United Arab Emirates to the United Nations, 'UAE Announces Net-Zero by 2050 Strategic Initiative' (2021).

101 Climate Action Tracker, 'CAT Climate Action Update, UAE' (2020).

102 The United Arab Emirates Government Portal, 'National Climate Change Plan of the UAE' <<https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/federal-governments-strategies-and-plans/national-climate-change-plan-of-the-uae>> accessed 1 December 2021.

reduction pledge of 23.5% in GHG emissions relative to a business-as-usual scenario of 310 MtCO_{2e}. The majority of the Emirati power supply is produced from natural gas and the Emirati government decided to build upon the 2021 alternative energy target of 24%, outlined in the UAE's first NDC.

The UAE is also investing significantly in nuclear energy by constructing the four-reactor Barakah nuclear power plant. The NDC states that by 2030, installed clean power capacity, including nuclear and solar, will reach nearly 14 GW, rising from almost 100 MW in 2005 and 2.4 GW in 2020.¹⁰³ As of 2020, approximately USD 40 billion has been invested in developing clean energy across the country. However, as of late 2021, the UAE has not set the NDC target in its national legislation.

In addition to the alternative energy benchmark, other stated efforts relate to the building/construction, energy/power tariff reconfiguration, transportation, and energy sector (See Tables 6 and 7 in Annex). These targets do not yet have any firm numbers related to potential emissions reductions. Dubai also created a localized carbon trading framework in December 2012, but this is not listed in the UAE's official NDC as of yet.¹⁰⁴

The UAE has nevertheless announced highly ambitious plans. The Dubai Supreme Council of Energy unveiled the *Dubai Clean Energy Strategy 2050* in

early January 2017, which states that the Emirate would funnel approximately USD 163 billion to generate 75% of Dubai's energy from alternative sources. This projection envisioned in the UAE's *National Energy Strategy 2050* sets a target of 44% of renewables and 6% of nuclear energy in installed power capacity by 2050, while also reducing the nation-wide power demand.¹⁰⁵ At the same time, the 2050 strategy also maintains that there will be 12% of coal and 38% of natural gas-fired power production. This plan intends to reduce carbon emissions by seventy% and increase energy efficiency by 40% by 2050. Notwithstanding the above, the Dubai Clean Energy Strategy is not included in the UAE's NDC.

Further, while the UAE's greenhouse gas reduction plans are broad and far-ranging, fiscal and regulatory challenges could hinder its achievement. The UAE would have to prepare the domestic business market for the radical transition away from hydrocarbons to alternative energy to realize its climate pledges. This is important because, as planned, the UAE foresees the private sector with a more prominent role instead of relying on large-scale government-funded projects that would engage in clean energy promotion. The Emirati regulatory sector has not traditionally been oriented to smaller and more decentralized renewable energy production, such as roof-top solar panels for small businesses and private residences, which could pose future challenges.¹⁰⁶

The implementation of feed-in tariffs (FiTs) should enable renewable energy generation to expand.¹⁰⁷ FiTs have a vital role when a country's solar industry is in its infancy, but deregulated, and market-driven power tariffs would provide a stimulating role for deployment over the long term. Moreover, the divergence between the levelized cost of electricity and the current average cost of electricity tends to create obstacles for the UAE's solar energy deployment.¹⁰⁸ For example, in Abu Dhabi, power tariffs would likely have to increase by about two-thirds before solar power investments and purchases become fiscally viable cost-saving strategies for small businesses and the residential sector.¹⁰⁹

Furthermore, if Abu Dhabi develops an efficient regulatory framework, then solar power contractors would grant residential clients reduced rates. There are regulations in the UAE that prohibit sloped roofs, which add an additional barrier to deploying solar panels residentially.¹¹⁰ Solar energy contractors also

103 UAE NDC, 2.

104 However, it is expected to that it will be included in the updated NDC by 2020.

105 Climate Action Tracker, 'CAT Climate Action Update, UAE' (2020) <<https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/federal-governments-strategies-and-plans/national-climate-change-plan-of-the-uae>> accessed 1 December 2021; UAE National Energy Strategy 2050, The United Arab Emirates Government Portal <<https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/federal-governments-strategies-and-plans/uae-energy-strategy-2050>> accessed 1 December 2021.

106 Abhinav Banerji Das, 'A Guide to Solar Power Generation in the United Arab Emirates' (2014) Middle East Solar Industry Association.

107 See generally, Daisuke Sasaki and Gun Matsuo et al, 'The Effect of Implementing a Feed-in Tariff in Abu Dhabi UAE' (2016) *Applied Economics and Finance* 4; J. Al-Amir and B. Abu-Hijleh, 'Strategies and Policies from Promoting the Use of Renewable Energy Resource in the UAE' (2013) *Renewable and Sustainable Energy Reviews* 26, 660–667.

108 This is related to the subsidization of natural gas power generation.

109 Natural gas-fueled power tariffs range between U.S 5.8-8.7 cents per KWH in Abu Dhabi and between 6.3-10.4 cents per KWH in Dubai for expatriates.

110 IRENA, 'Renewable Energy Prospects: United Arab Emirates' (2015) 41.

face a relatively long timeline to connect solar panels to the grid. Another issue that raises obstacles to renewable energy is the federal political structure of the UAE. Because each Emirate develops its own renewable energy policy, the risk that time lags may occur between the promulgation of federal policy and the enactment of a national legal framework becomes even more significant.

b. Is the Emirati NDC Equitable, Transparent and Ambitious?

While the Emirati NDC sets out a multitude of methods to reach its greenhouse gas reduction goals, it remains unclear on several issues. The UAE's 2016 NDC did not contain an emissions reduction target. It only had a clean energy target to be reached by 2021. However, when we view the 2020 NDC, it is clear that progress has been made. The current target is a 23.5% reduction in GHG emissions below the business-as-usual scenario in 2030. The NDC took 2016 as a baseline and did not incorporate the economic turbulence associated with the pandemic as it based the business-as-usual assumption on historical growth trends.

With regard to whether the Emirati NDC is equitable, the UAE's climate pledges for 2030 would not work effectively towards keeping global warming to below 2°C, much less towards limiting a global temperature increase to 1.5°C.¹¹¹ Instead, if all countries were to incorporate the UAE's approach to global warming, temperatures would likely increase between 2 degrees Celsius and 3 degrees Celsius. Prior to the Covid-19 pandemic, the UAE's GHG emissions were projected to reach 280-300 million tons (excluding LULUCF).¹¹² This would have been approximately a 46-58% increase compared to 2010 levels. However, with the current measures and the impact of the pandemic, the UAE would likely reach its emissions levels from the 24% clean energy target in the NDC. Overall, including the pandemic effects, 2030 emissions would likely only decline by 10-16%.¹¹³ Therefore, the Emirati NDC may not be considered equitable in the sense of undertakings its fair share of emissions reductions to limit the global temperature rise at 1.5 degrees celsius.

As to transparency, the UAE undoubtedly took steps to make its macroeconomic greenhouse gas reduction targets much more apparent. In its 2016 NDC, it only described various energy efficiency and build-

ing code frameworks that did not mention potential greenhouse gas metrics. However, in its updated 2020 NDC, as stated above, the UAE outlined a 2030 emissions reduction pledge of 23.5% in GHG emissions relative to a business-as-usual scenario of 310 MtCO_{2e}. And the delineated scope and coverage of GHG emissions reductions with its sectoral coverage are consistent with IPCC guidelines. The second NDC includes a more comprehensive list of mitigation strategies and policies in essential economic and industrial sectors. And it also announces the establishment of new federal and emirate level climate policy governance structures. Yet, the NDC does not contain any long-term emissions reductions target, and there is a lack of transparency on the sources utilized to calculate the 2030 business-as-usual scenario and various other assumptions. Overall, this NDC enhanced clarity due to the GHG emissions reduction targets having been clarified. However, there is still uncertainty regarding the concrete steps that the UAE intends to undertake to meet its obligations. And, while the UAE announced a net-zero pledge before COP26, there have been no details released as to how it intends on meeting that goal. As a result, the Emirati NDC has low-to-moderate transparency.

Lastly, considering that the UAE is a significant hydrocarbon producing country and depends on oil for domestic consumption and export, the acceptance of the Paris Agreement is an important step. The announcement of its net-zero pledge is somewhat revolutionary in the sense of "breaking the mold" for the region. Additionally, the UAE made its 2020 NDC more robust by setting quantifiable 2030 targets for GHG emission reductions, and it increased the scope of the GHG gasses covered in its updated NDC to include methane, nitrous oxide, and perfluorocarbons. Compared to the 2016 NDC, it can be witnessed that the UAE is increasing the ambition of its decarbonization plans.

However, while the Emirati NDC has stated expanded goals to decrease its GHG reduction goals, it did set its business-as-usual scenario at 2016, and only takes into account the mitigation policies implemented at that time. Since 2016, Emirati natural gas

111 Climate Action Tracker, 'UAE' <<http://climateactiontracker.org/countries/uae.html>> accessed 1 December 2021.

112 Climate Action Tracker, 'CAT Climate Action Update' (2020).

113 *ibid.*

consumption has plateaued as its energy efficiency policies, natural gas/power pricing reconfiguration and renewable energy projects came online. To that extent, while its on-the-ground deployment of renewable energy investment has proceeded, much of this progress has not been clearly noted in its NDC. It is possible that the UAE seeks, to a certain degree, to be held to a lower standard by the international climate treaty, while it still engages in significant clean energy investment. But, as its NDC stands, it lacks the ambition to take any further steps outside of the promulgated internal energy/carbon Emirati policies of 2016. Its NDC may be classified as moderately ambitious, but with a trend for the UAE undertaking more ambitious goals moving ahead, especially in subsidiary projects not accounted for in its official pledges. It is worthwhile to note here that as with Saudi Arabia and Qatar, the UAE intends to drastically increase its oil production for export to the global market. Therefore, to a certain degree, some aspect of the domestic decarbonization policies will have the result, whether explicitly intended or not, of reserving more hydrocarbon export to the international market. However, this export posture is not considered in the assessment of its NDC.

3. The Qatari NDC

By submitting its INDC on November 19, 2015, i.e., almost a week and a half before COP 21 was inaugurated, Qatar became one of the last countries to submit its carbon mitigation plans.¹¹⁴ More precisely, Qatar became the 150th Party to the Paris Agreement on June 20, 2017, and Qatar's INDC transformed in-

to an NDC.¹¹⁵ Qatar's first NDC (See Table 9 in Annex) focused upon several issues, including its vulnerability to climate change which impacts sea level rise. Ninety-six percent of Qatar's population resides in coastal areas.¹¹⁶ This NDC also stressed that Qatar is home to unique flora and fauna that could face extinction with an increase in global temperature.¹¹⁷ As Qatar is a small peninsular nation, it is nearly as vulnerable to climate change as most small island nations. It lacks potable water and has an average rainfall of only 82 mm per year.¹¹⁸

If the average global temperature rises and there is a corresponding drop in rainfall, then Qatar's soil would experience significant moisture losses. Two critical issues must then be confronted, an increase in desertification and a surge in domestic water requirements. Therefore, in its first NDC, Qatar stressed the threat to human habitability from climate change and focused on adaptation measures, perhaps more so than Saudi Arabia and the UAE. This first NDC was promulgated with the intent to reflect that Qatar focused on adaptation, economic diversification, and mitigations that were all granted equal treatment as per Article 4.7 and Article 7 of the Paris Agreement.

Qatar submitted its second NDC in August 2021 (See Table 10 in Annex) and unveiled a new climate change action plan, which set a target of 25% GHG reductions by 2030, relative to a baseline scenario of business-as-usual, and to also reduce the carbon intensity of its LNG production infrastructure by 25% by 2030. Additionally, the updated NDC stressed that Qatar would redouble its efforts to deploy CCS usage at its LNG facilities. This updated NDC differed from the first in that Qatar sought to enhance its ambitions and reduce its overall GHG emissions as outlined in Article 4.4 of the Paris Agreement.

However, Qatar's GHG emissions have been rising, reaching 116 MtCO₂ in 2019. And Qatar's carbon emissions from fuel usage have nearly risen by a factor of four since 2000, from 24 MtCO₂ to 88 MtCO₂ in 2020.¹¹⁹ In 2019, Qatar had the highest per capita CO₂ emissions in the world (33 MtCO₂/capita).¹²⁰ Qatar has a delicate balancing act in its decarbonization drive as it seeks to increase its LNG production to 127 million tons/year 2027, from 79 million tons/year and thereby outstrip its closest LNG rivals.¹²¹

Even though Qatar has the highest ratio of GDP per capita in the world, its NDC stated that 'interna-

114 UNFCCC, Qatar INDC Report (2015) <<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Qatar/1/Qatar%20INDCs%20Report%20-English.pdf>> accessed 1 December 2021.

115 Qatar's INDC entered into force on 23 July 2017. See, UNFCCC, 'Paris Agreement: Status of Ratification' <http://unfccc.int/paris_agreement/items/9444.php>

116 Qatar INDC, 2.

117 *ibid.*

118 A. A. Mamoon and A. Rahman, 'Rainfall in Qatar: Is it Changing?' (2017) *Natural Hazards* 85, 453.

119 Enerdata, 'Qatar Aims to Reduce its GHG Emissions by 25% in 2030' (2021).

120 *ibid.*

121 Andrew Mills, 'Qatar Targets 25% Cut in Greenhouse Gas Emissions by 2030 Under Climate Plan' (2021) Reuters.

tional climate change measures and policies shall be in line with the provisions of the of the United Nations Framework Convention on Climate Change, in particular, Article 3 paragraph 2 and Article 4 paragraph 8(h) and 10 and shall ensure the developing countries' eligibility for finance, technology transfer, and capacity building.¹²² As the world's foremost LNG exporter, Qatar, with some accuracy, portrayed its LNG investments, as 'contributing indirectly to the global efforts to mitigate climate change'.¹²³

As with Saudi Arabia and the UAE, Qatar sought to embed the principle of economic diversification through environmental/carbon mitigation co-benefits into its NDC. This core issue was arrived at through a national dialogue with a 'stakeholder consultation group' to develop an NDC that fairly represented Qatar's domestic interests. Further, Qatar collaborated with other countries for which economic diversification provides the most plausible path towards future sustainable development. Qatar's NDC also indicated that it seeks to increase the proportion of renewable energy, for example, by using solar in the domestic energy mix.¹²⁴ While Qatar's NDC does not delineate specific solar projects, a joint project between Qatar Electricity and Water Company and Qatar Petroleum began the initial work in 2017 on Qatar's largest solar power project.¹²⁵

Qatar's first solar power plant, Al Kharsaah, started operations in 2021, and is slated to generate 800 MW. It is the country's first utility scale solar power plant intended to provide solar power for the upcoming Qatar 2022 World Cup. For the long-term, Qatar announced a target to produce up to 10 GW of solar energy by 2030. Qatar was criticized for its first NDC as it did not contain clear renewable energy and carbon mitigation targets.

However, as with Saudi Arabia and the UAE, Qatar's decarbonization goals have an important caveat, as explained in 2012 by Fahad Bin Mohammed al-Attiya, Chairman of the organizers of the talks during COP 18, announced that 'Qatar is pursuing voluntarily a national initiative to reduce greenhouse gas emissions as long as they are in line with sustainable development.' And, he explained that 'to Qatar, climate change represents double jeopardy.'

However, its updated 2021 NDC rectified this and delineated a stated goal of a 25% GHG reduction for the year 2030, relative to a business-as-usual scenario based on 2019. However, in 2012 Fahad Bin Mohammed al-Attiya, Chairman of the organizers of the

talks during COP 18, announced that 'Qatar is pursuing voluntarily a national initiative to reduce greenhouse gas emissions as long as they are in line with sustainable development.'¹²⁶ And, he explained that 'to Qatar, climate change represents double jeopardy.'

Along with statements issued by other Qatari officials, such anecdotal indications suggest that Qatar, and perhaps Saudi Arabia and the UAE, may have more extensive internal targets to limit carbon emissions and deploy renewable energy. Yet, facing the prospect of 'double jeopardy,' these countries initially appeared reluctant to be obligated in a multilateral document that carries the force of law. In a sense, they would prefer to 'overperform' in meeting their NDCs, as opposed to set overly ambitious targets and thereby 'underperform.'

a. Is the Qatari NDC Equitable, Transparent and Ambitious?

It is apparent that Qatar intends to continue its established policy of consuming its natural gas as a sizable proportion of its domestic energy mix for the foreseeable future and increasing its LNG production footprint. In its updated NDC, Qatar formulated more definite plans by targeting GHG emissions reductions by 25% by 2030 (relative to a business-as-usual scenario). This indicates that Qatar foresees that it must take action to reduce its carbon emissions. But in consideration of whether Qatar's NDC is equitable, it must be assessed whether it is undertaking its fair share of climate mitigation and adaptation in line with other global commitments.

While Qatar is not historically as responsible for the rise in global temperature as the developed countries, over the past several decades, as discussed in Section II.1, it rose to have the highest per capita carbon emissions in the world, at 37 metric tons per person. But despite its high per capita carbon emissions, it has low aggregate emissions. The majority of its high carbon intensity is due to providing natural gas for the rest of the world. Natural gas is largely con-

¹²² Qatar INDC, 2.

¹²³ *ibid.*

¹²⁴ Qatar INDC, 3.

¹²⁵ It is a 200-megawatt project that will come online in 2020, and able to be expanded to 500 megawatts.

¹²⁶ Reuters, 'OPEC Member Qatar Says to Start Embracing Solar Energy' (2012).

sidered to be a bridge fuel in the transition to a low-carbon global economy.

And, in line with the UNFCCC articles based on fairness and ambition as per national circumstances, Qatar is mainly dependent on hydrocarbon revenue for its economic health. Therefore, when considering its low aggregate carbon emissions, alongside its enhanced reductions in its latest NDC, Qatar's climate pledges can be regarded as moderate-high equitableness when balancing its historical responsibility with its current obligations of supplying the world with lower carbon natural gas as a bridge fuel to a low-carbon transition.

As with the Saudi and Emirati NDC, the Qatari NDC does suffer from a lack of transparency as there are no identifiable targets for either renewable energy generation or sectoral GHG reduction plans. However, its NDC was greatly improved by including specific sectors to be covered and baseline scenarios. As a result, it can be considered that the Qatari NDC is moderately transparent and can be improved when it responds to the COP26 request of the submission of strengthened pledges.

As to whether the document is ambitious, the Qatari document is aspirational to a large degree. However, it contains several essential caveats to the effect that if its economy is unduly impacted by climate change mitigation, it reserves the right to modify its NDC. Qatar's NDC also indicates that its renewable energy deployment progress depends on that country's access to Western technology. However, when balanced against the large-scale carbon reduction and energy efficiency initiatives the country is undertaking across its LNG production value chain, it has made a firm initial step to reduce its GHG emissions.

But Qatar can still do much more in terms of investment in renewable energy for its domestic power generation. Qatar, in contrast to the UAE and Saudi Arabia—as well as many other developing countries—did not announce a net-zero goal. And given Qatar's prodigious wealth and its number one position in global per capita carbon emissions (35.77 tons per person), its carbon emissions reduction commitments are not as ambitious as some of its peers.

Overall, the Qatari NDC is moderately ambitious with clear goals to reduce carbon emissions but lacking precise renewable energy investment targets.

V. Recommendations for the Development of Effective Decarbonization Policies

As discussed above, it was quite a circuitous route for Saudi Arabia, the UAE, and Qatar to accept the reality of climate change and take the necessary steps to restructure their macro-economies. However, eventually, the realization dawned upon them that it was in their self-interest to reduce the carbon intensity of their economies to promote economic diversification in the face of rising domestic energy consumption and spur industrial innovation and private sector growth. But, additionally, the Gulf countries, on the whole, recognized that they are particularly vulnerable to climate change, which has the potential to make the region nearly uninhabitable in the long term.

As stated earlier, this article did not consider the potential impact of Hans-Werner Sinn's theory of the Green Paradox, whereby the expected future stringency of multilateral climate treaties could compel the Gulf countries to accelerate their oil production for export to the global market. This, of course, would lead to a spike in global GHG emissions, contrary to the spirit of the Paris Agreement and COP26 pledges. However, this does seem to be occurring as Saudi Arabia announced in October 2021, prior to COP26, that its flagship national oil company, Aramco, would substantially increase its oil production capacity from 12 million barrels per day to 13 million barrels per day by 2027.¹²⁷ Following that announcement, the UAE declared in December 2021 that it would meanwhile invest a \$127 billion capital spending plan for 2022-2026 in its oil and gas sector.¹²⁸ It is likely that the impetus behind these oil investment policies is that the hydrocarbon-rich Gulf countries foresee that subsequent multilateral climate negotiations will increasingly target the emission sources, rather than simply aggregate emissions, and would diminish the future value of their oil reserves.

Overall, the three selected Gulf countries' NDCs are vague to a certain degree. Many of their mitigation policies have already been implemented or announced, but in many cases, have not been delineat-

127 Offshore Technology, 'Saudi Aramco Commits to Reach 13 MMBpd Capacity by 2027' (2021).

128 UAE's ADNOC to invest \$127 bln in 2022-26 as Oil, Gas Reserves Rise, Reuters (Dec. 1, 2021)

ed in their NDCs. What is apparent from the analysis is that while the three selected Gulf countries lack a certain robustness in their NDCs, that defect is not taken to mean that there is also a lack of resources or on-the-ground policy implementation to promote energy efficiency and renewable energy deployment. The three countries did not incorporate the entirety of their already significant investments in alternative energy sources and energy efficiency plans in their NDCs. It is within the realm of possibility that one of the reasons for the lack of incorporating the totality of decarbonization plans is that the three countries did not seek to be potentially held liable in a multilateral document that ostensibly carries the force of law.

Despite the theoretical literature on carbon abatement instrument design, governments often cannot create and deploy carbon mitigation instruments without accounting for certain political realities. Therefore, understanding why some instruments are adopted over others requires weighing the ease with which the various abatement mechanisms could be adopted and the acceptance by the industrial interests in the region.

And, while there is a wealth of literature on the EU ETS, the U.S. experience with the Acid Rain Program market framework to control sulfur dioxide and nitrogen oxides, as well as how a national or regional carbon market could potentially succeed in North America, there is still a significant gap in the literature relative to the potential applicability of carbon emissions abatement programs in the Gulf states. Even though the region has the highest per capita global carbon emissions, research analyzing the decarbonization potential of the region is sparse.

In order to meet their Paris Agreement pledges, it is recommended that the three countries implement a national carbon abatement framework. It is recommended that Saudi Arabia and the UAE implement a national carbon trading program to meet their COP26 pledges and for Qatar to establish a command-and-control carbon reduction framework.

It is preferable to establish carbon trading platforms segmented in a three stage process. Carbon market development is more viable for the UAE and Saudi Arabia because of their more advanced industrial sectors, the growing financialization of their economies, and larger populations. For Qatar, due to its small population size, and limited absorptive capability in its economy, a command-and-control car-

bon emissions reduction framework would likely be more successful.

For the UAE to establish a national carbon market, an initial trail phase, or a learning-by-doing pilot stage deployment is preferable, as the other emirates besides Dubai and Abu Dhabi would need to create GHG inventories, which would require some time to establish. . In addition, standardized GHG assessment methodologies would need to be established according to the UNFCCC reporting guidelines on annual inventories. As a result, phase one would require approximately three years. After that, phase two would require an additional three years to implement a national cap and begin the national operation of the market. Phase three would operate for nearly a year to extend the cap to various other industries as they acclimate to the carbon reduction policies. In total, the UAE would require almost seven years from inception to be fully operational and could be fully operational by 2030 if efforts are made early this decade.

In Saudi Arabia, the first phase of carbon market development would require the Saudi government to establish essential coordination among the country's myriad environmental and energy agencies. Moreover, the Saudi government would need to improve regulatory compliance in the industrial sector and implement capacity building for regulatory officials. Phase one would require about four years to operate effectively as the pilot schemes in the country's industrial centers begin to be established. Phase two would necessitate the Saudi government to create a national baseline and facilitate mock trading at the national level. Therefore, this phase would require three years to operate successfully. And phase three, which would herald the launch of the national market, would need approximately two to three years as the Saudi regulatory authorities extend the cap to the relevant sectors in the macroeconomy.

In Qatar, the first phase of its command-and-control carbon abatement framework would require the development of a governance framework to regulate and standardize the exchange of information between the various ministries and relevant companies. This phase would also include collecting GHG emissions data and would be valid for three years. The second phase would determine which companies adhere to the zero flaring policy and use energy-efficient industrial equipment, which would be valid for two years. After that, Qatar's regulatory framework would determine whether greenhouse gas emissions

need to be reduced further and what additional regulations the government should promulgate.

With Phase One data in hand, Gulf policymakers could be well placed to initiate a viable Phase Two, potentially transitioning from the voluntary carbon limitations in Phase One to binding commitments on companies. Phase Two would enable a gradual tightening of the annual cap and encourage technological adaptation. When Phase Three is launched, policymakers would set more ambitious targets since the economic and industrial sectors would already understand how the trading platform works and have already invested in carbon mitigation technology.

In summary, while the three selected Gulf countries have institutional deficiencies, they are not insurmountable, and if the policymakers desire, they would be able to implement effective national carbon abatement schemes. But it should be reiterated that the complete process would take a little less than a decade for Saudi Arabia and the UAE. At the same time, Qatar could establish a viable command-and-control regulatory structure much more quickly.

Policymakers should ensure that they put in place a robust regulatory framework to monitor and en-

force the appropriate rules and technical benchmarks on both a direct and indirect level. They should also develop long-term incentives to encourage and stimulate the relevant companies and organizations to invest in renewable energy and energy-efficient technologies to mitigate carbon emissions. Overall, there would need to be clear political will, alongside the granting of incentives, that telegraphs the governmental aims that must be followed. Additionally, the policymakers of the three selected countries must make sure that their regulatory agencies are given a clear mandate and sufficient powers to promulgate standards and enforce rules.

Finally, a comprehensive plan that creates backward and forward linkages across the economy should be developed to create a synergistic dynamic that would provide the impetus for further economic growth. With the formulation and introduction of clear and coherent national decarbonization policies, as recommended above, that integrate the various carbon reduction initiatives, the NDCs of these countries will become much more transparent, ambitious and equitable to sufficiently meet the challenge of forestalling global climate change.

Annex

Table 1: Gulf Hydrocarbon Producers' Core Positions During Climate Negotiations (From Kyoto to Glasgow)

<ul style="list-style-type: none"> • Hydrocarbon-producing countries feared that the global implementation of either a carbon trading or a carbon taxation regime would cause a marked decline in global oil demand, raising the price of oil to consumers.
<ul style="list-style-type: none"> • A decline in hydrocarbon-based revenue to producing countries would negatively affect their ability to implement sustainable economic development and expand social welfare. An unstated concern is that decreasing foreign revenue would stimulate socio-political discord in many producing countries.
<ul style="list-style-type: none"> • Carbon taxation is one of the most prevalent methods of carbon emissions reduction. This abatement method would cause a growth in the 'rent' that various (principally developed) consuming countries acquire in the global energy market. Thereby increasing the transfer of wealth from producers to consumers.
<ul style="list-style-type: none"> • An increase in renewable energy subsidies would likely be at the expense of hydrocarbons. And, according to hydrocarbon producers, would be unfair trade discrimination.
<ul style="list-style-type: none"> • Significant technological innovation would be required to refashion hydrocarbons into a less carbon-intensive fuel.
<ul style="list-style-type: none"> • Developed countries should create a viable framework for transferring carbon abatement/renewable energy technology to developing (including producer) countries.
<ul style="list-style-type: none"> • Carbon capture and storage is a viable technology that can ensure hydrocarbons will continue to meet energy demand in a decarbonized world for the future.
<ul style="list-style-type: none"> • Developed countries bear the historical cost of global carbon emissions. And, therefore, should establish adequate compensation mechanisms for producing countries that would experience foreign revenue decline.
<ul style="list-style-type: none"> • The science of anthropogenic climate change is largely unproven and thereby needs to be researched in much more depth. Some Gulf policymakers believed climate change to be a hoax perpetrated by Western countries to impede their economic development.
<ul style="list-style-type: none"> • Hydrocarbons still constitute the majority of the global energy mix. Any rapid steps to reduce its demand would cause severe economic disruption for the producing countries and cause price shocks for the consumers in the developed and developing countries.
<p>Sources: Suraje Dessai, 'An Analysis of the Role of OPEC as a G77 Member at the UNFCCC' (2004) <https://wwfint.awsassets.panda.org/downloads/opecfullreportpublic.pdf></p>

Equity principle	Interpretation	General operational rule
Egalitarian	Every individual has an equal right to pollute or to be protected from pollution	Allow or reduce emissions in proportion to population
Sovereignty	All nations have an equal right to pollute or to be protected from pollution; current state of emissions constitutes a status quo ("grand-fathering")	Proportional reduction of emissions to given or existing emission levels' or equal percentage of emission reductions
Polluter pays	Welfare losses corresponding to gains by emissions	Share abatement costs across countries in proportion to (eventually including historical emissions) emission levels
Ability to pay	Mitigation costs vary directly with national economic well-being	Equalize abatement costs across nations (costs as proportion of GDP equal for each nation)
Horizontal	All countries with similar features have similar emissions rights and burden-sharing responsibilities	Equalize net welfare change across nations—net cost of abatement as a proportion of GDP
Vertical	Welfare losses vary positively with national economic well-being, welfare gains vary inversely with GDP	Progressively share net welfare change across nations, net gains inversely and net losses positively correlated with per capita GDP
Utilitarian	Achieving the greatest good (happiness) for the greatest number	Maximize net present value of the sum of individuals utility (maximize social welfare).
Compensation	No nation should be made worse off	Compensate net losing nations
Rawls' maximin	The welfare of the worst-off nations should be maximized	Maximize the net benefit to the poorest nations
Market justice	Market justice	Allocate emissions permits to the highest bidder
Consensus equity	The negotiation process is fair	Seek a political solution to emissions reduction
Convergence	Equalize per capita emissions	Converge to an upper boundary of emissions
Environmental	The environment receives preferential treatment	Maximize environmental values and cut back emissions accordingly

Table 2: Equity Principles and Burden Sharing Rules

Table 3: Foundation for an NDC

Elements of a Holistic NDC	Key Considerations
Ambition	Whether the NDC seeks to implement GHG emissions reductions through a viable and clearly defined framework? Is the country able to implement more reductions without significant economic disruption? Is the political will adequately telegraphed for decarbonization implementation? Will the NDC assist in meeting the collective goal of maintaining global warming below 1.5 degrees Celsius?
Transparency	Does the NDC have an efficient mechanism for monitoring progress toward the pledged targets?

Equitableness	Is each party undertaking a fair share of climate mitigation and adaptation to achieve the target of a global temperature increase below 1.5 degrees Celsius?
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Table 4: Main Elements of Saudi Arabia's First NDC (2016)

<p>Saudi Arabia seeks to diversify its economy from a singular dependence upon hydrocarbon-generated income. The principal impetus for Saudi Arabia's NDC is to accelerate economic diversification. Saudi Arabia's NDC is designed so that the following policies and actions will generate mitigation co-benefits and contribute to economic diversification that allows Saudi Arabia to meet its greenhouse gas reduction pledges.</p>
<p>Copenhagen Pledge 2020 Target: None</p>
<p>Paris Agreement Target: Yes</p>
<p>Ratification: Yes (Dec. 3, 2016)</p>
<p>2030 Target:Economy-Wide Annual Abatement of 130 MtCO_{2e} after 2030 (ex. Land Use and Land Use Change and Forestry)</p>
<p>Alternative Energy Deployment: Invest and deploy ambitious programs for alternative energy to increase its role in the domestic energy mix. This includes nuclear power, solar PV and Solar CSP, wind energy, geothermal energy, and waste-to-energy technologies. Towards the goal of expanding renewable energy use in the Kingdom in 2017, Saudi Arabia announced a renewable energy investment plan of between \$30-50 billion comprising approximately 60 projects with 9.5 gigawatts of renewable energy (capacity) to be produced annually by 2023. In August 2017, the Saudi government announced that it planned to exceed its target of 9.5 gigawatts. However, further details were not forthcoming at the time of its announcement.</p>
<p>Energy Efficiency: Saudi Arabia seeks to promote, stimulate and support policies to implement carbon mitigation co-benefits in energy efficiency. The Saudi energy efficiency program currently focuses on three main sectors, construction, industry, and transportation, accounting for over ninety percent of the Kingdom's energy consumption. Saudi Arabia intends to derive most of the mitigation co-benefits from the introduction of efficiency standards in the transportation and construction sectors and the implementation of energy efficiency measures in the industrial sector. Additionally, this program seeks to convert single-cycle power plants to combined cycle power plants rapidly. As part of its energy efficiency program, Saudi Arabia plans to reduce power and water subsidies by \$53 billion and reduce non-oil subsidies by twenty percent by 2020.</p>
<p>Carbon Capture and Utilization/Storage: Saudi Arabia intends to construct the world's largest carbon capture and storage plant. The Saudi Aramco CCS plant aims to capture and purify approximately 1,500 tons of CO₂ a day for use in various petrochemical plants across the country. Forty million standard cubic feet a day of CO₂ will be captured, processed, and injected into the 'Uthmaniya oil reservoir to enhance oil recovery.</p>
<p>Gas Utilization: Saudi Arabia seeks to stimulate and funnel investments into the natural gas sector to transition away from the domestic consumption of oil. As natural gas is less carbon-intensive than oil, the displacement of oil consumption would lead to lower carbon emissions, thus realizing a large part of Saudi Arabia's mitigation co-benefit goals. As part of the National Transformation Program, Saudi Arabia intends to increase gas production from 12 Bcf/d to 17.8 Bcf/d by 2020 and deploy more combined cycle power plants to transition from open cycle power generation.</p>
<p>Methane recovery and flare minimization: Saudi Arabia is currently taking action to conserve, recover and reuse methane and promote the reduction of flaring and fugitive emissions. Saudi Arabia joined the Global Methane Initiative in 2014. Saudi Arabia has made strides in natural gas flaring reductions. In 1974, gas flaring accounted for nearly seventy-five percent of its hydrocarbon emissions. Due to better hydrocarbon management practices, the government reduced flaring to less than one percent of total emissions. However, based on the most recent data, Saudi Arabia still ranks at eleventh globally for gas flaring.</p>
<p>Sources: Saudi Arabia INDC (2016) and Climate Action Tracker <http://climateactiontracker.org/countries/saudiarabia.html></p>

Table 5: Main Elements of Saudi Arabia's Updated NDC (2021)

<p>Saudi Arabia submitted its updated NDC on October 23, 2021. It reaffirmed its commitment to the Paris Agreement goals through mitigation co-benefits through economic diversification and adaptation. It increased its ambition by raising its 2030 emissions reductions target from 130 MtCO₂e in its first NDC (2016) to 278 MtCO₂e. However, Saudi Arabia states that its aspirations are contingent on long-term economic growth and diversification that will still rely upon a large contribution from its hydrocarbon export revenues to the national economy. The Saudi NDC also predicated its GHG reduction policies on the assumption that the socio-economic consequences of international decarbonization actions will not pose a disproportionate or abnormal burden on the Saudi economy, as per Paragraph 2 of Article 3 of the UNFCCC. The updated 2030 targets utilize the Circular Carbon Economy Approach.</p>
<p>Paris Agreement Target: Yes</p>
<p>Ratification: Yes (Oct. 23, 2021)</p>
<p>2030 Target: Economy-Wide: Increased its 2030 emissions reductions target from an annual abatement of 130 MtCO₂e in its first NDC (2016) to 278 MtCO₂e after 2030 (ex. Land Use and Land Use Change and Forestry).</p>
<p>Alternative Energy Deployment (Power Sector): Renewable energy projects will diversify the energy mix used in electricity production. The renewable energy ambition aims to reach around 50% of the energy mix by 2030. Through the National Renewable Energy Program, the Kingdom will implement a set of comprehensive reforms, regulations, and policies to stimulate private sector investment, research, and development, employment in renewables. The program sets a roadmap to diversify local energy sources, encourage economic growth, and establish the local renewable energy supply chain and industry. The Kingdom will seek to localize a significant portion of the renewable energy value chain in the Saudi economy, including research & development and manufacturing. Specific technologies for deployment include solar PV, concentrated solar power, wind, geothermal energy, waste to energy, and green hydrogen.</p>
<p>Energy Efficiency: Numerous initiatives will be implemented to improve and raise the efficiency of energy consumption in the targeted sectors, including improving the efficiency of home appliances and air conditioning units, improving the efficiency of feedstock utilization in key strategic industries such as petrochemicals, improving transportation fleet fuel economy, phasing out inefficient used light-duty vehicles, implementing aerodynamic regulation for heavy-duty vehicles, and improving the thermal efficiency of power generation, transmission, and distribution. The National Energy Services Company (Tarshid) incentivized energy efficiency in government buildings and private sector investment in energy efficiency services. It plans to retrofit the entire pool of public and governmental assets and facilities, including 2 million street lights, 110,000 government buildings, 35,000 public schools, 100,000 mosques, and 2,500 hospitals and clinics.</p>
<p>Blue Hydrogen: The Kingdom is developing a National Hydrogen Strategy to chart pathways to become a global leader in the hydrogen industry. With associated carbon emissions captured, utilized, and/or stored in geological formations, blue hydrogen can be utilized domestically in various industrial sectors. Pilots, research, and demonstrations will be prioritized to improve technology maturity and lower costs in the aviation, shipping, petrochemicals, and steel industries.</p>
<p>Carbon Capture and Utilization/Storage (CCUS): To advance the uptake of CCUS technologies and scale up its deployment, the Kingdom plans to transform Jubail and Yanbu into global hubs for carbon capture, utilization, and storage. The hubs will leverage the concentration of the manufacturing industry, proximity to sinks, and transport infrastructures. Jubail and Yanbu are homes to the regional petrochemicals, steel, and other heavy industries. Both cities represent the economy of scale opportunity to reduce, reuse, recycle, and remove GHG emissions.</p>
<p>Gas Utilization: As part of reforms of its domestic energy sector, the Kingdom aims to increase the utilization of natural gas in its energy mix. By 2030, the Kingdom aims that up to 50% of its electricity generation is expected to be met by natural gas, significantly lowering the carbon intensity of domestic energy generation.</p>
<p>Methane recovery and flare minimization: The methane management measures include zero flaring in the oil and gas industry, recovery, and subsequent utilization for power generation and petrochemicals production. The Kingdom as a member of the Global Methane Pledge initiative, will collaborate with other members to reduce global methane emissions by 30% by 2030 relative to 2020 levels.</p>

Sources: Saudi Arabia NDC (2021) and Climate Action Tracker <<http://climateactiontracker.org/countries/saudi-arabia.html>>

Table 6: Main Elements of the UAE's First NDC (2015)

<p>The UAE is attempting to ambitiously diversify away from domestic hydrocarbon consumption and radically increase renewable energy production. The climate pledges of the UAE have already implemented policy as outlined within its economic blueprint for development, entitled, <i>Green Growth Strategy</i>. The Emirati NDC is intended to generate substantial mitigation co-benefits through its macro-economic diversification strategy.</p>
<p>Copenhagen Pledge 2020 Target: None</p>
<p>Paris Agreement Target: Yes</p>
<p>Ratification: Yes (Sept. 21, 2016).</p>
<p>Mitigation Target: Various Non-Quantified measures, alternative energy generation by 24% in 2021.</p>
<p>Land Use, Land Use Change, and Forestry: Not Mentioned</p>
<p>Long-Term Goals: None (However, other official government announcements indicate a plan for 75% alternative energy generation by 2050 by installed capacity). Each Emirate is responsible for creating its carbon emissions reduction strategy. The Emirati INDC did not list any firm and quantifiable carbon reduction targets, but it did outline the below actions to be undertaken. Most of the recorded measures are already implemented policies.</p>
<p>Reduction of Gas Flaring: To reduce gas flaring in the hydrocarbon sector and develop and deploy carbon capture and storage across the country.</p>
<p>Alternative Energy Development: Investment in nuclear, solar, carbon capture, and storage to increase alternative energy in the domestic energy mix to 24% by 2021 by installed capacity.</p>
<p>Electricity Pricing Reconfiguration: Broad power tariffs increase to reduce domestic energy demand.</p>
<p>Energy Pricing Deregulation: Increases in gasoline and natural gas prices to eventually meet international levels.</p>
<p>Energy Efficiency Standards: The creation of energy efficiency standards for residential appliances and the building sector (Abu Dhabi established in 2014) (Dubai established in 2011).</p>
<p>Country-wide Rail System: A planned national railroad network to reduce the use of personal automobiles.</p>
<p>Transport Sector: Significant investments in light rail and local metro systems (already in place in Dubai).</p>

Table 7: Main Elements of the UAE's Second NDC (2020)

<p>When the UAE submitted its first NDC, it did not pledge an emissions reduction target; it only had a clean energy target set for 2021. The UAE progressed significantly with a 2030 emissions reduction target in this NDC.</p>
<p>Emissions Reduction: Reduction of 23.5% in GHG emissions for the year 2030, relative to business-as-usual (BAU). The BAU scenario emissions in 2030 stand at about 310 million tons, assuming a moderate annual economic growth based on historical growth trends.</p>
<p>Type: Absolute, economy-wide emission reduction target relative to BAU.</p>

Scope and Coverage, Consistent with IPCC Guidelines: Key sectors covered: Energy, Industry Processes and Product Use, Waste, Agriculture, Land Use Change & Forestry Greenhouse gases covered: Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide (N ₂ O), Perfluorocarbons (PFCs).
Timeframe and Period of Implementation: From the start of 2021 to the end of 2030
BAU and NDC Target Scenarios: BAU scenario starts in 2016 and takes into account mitigation measures implemented by the UAE by the end of 2016. NDC Target scenario represents a deviation from the BAU, accounting for implemented and planned mitigation measures for the period 2017-2030.
If applicable, the Intention to Use Voluntary Cooperation under Article 6 of the Paris Agreement: While the UAE intends to primarily rely on domestic efforts to fulfill its NDC objectives, it may consider using voluntary cooperation under Article 6 of the Paris Agreement partially achieve these objectives.
Sources: UAE NDC (2020) < https://www4.unfccc.int/ >

UAE		Comparison of NDC targets		Climate Action Tracker
	2016 NDC	2020 NDC	Change	
2030 unconditional target(s)	Country's formulation of the target Increasing the contribution of clean energy in the total energy mix from 0.2% in 2014 to 24% by 2021	Reduction of 23.5% in GHG emissions in 2030 relative to a BAU of 310 MtCO ₂ e*		+
	Absolute emissions level [excl. LULUCF] [238 MtCO ₂ e in 2021** according to CAT calculations]	246 MtCO ₂ e in 2030**		
	Emissions compared to 1990 and 2010 [excl. LULUCF] [485% above 1990 levels in 2021] [24% above 2010 levels in 2021]	505% above 1990 levels in 2030 28% above 2010 levels in 2030		
	CAT rating Highly insufficient	Highly insufficient		
	Net zero-emissions target No	No		
	Alignment of NDC to long term target No long-term emissions reduction target available	No long-term emissions reduction target available		
	Sector coverage Energy	Economy-wide (Energy, Industry Processes and Product Use, Waste, Agriculture, LULUCF)		+
	Separate target for LULUCF No	No		
	Gas coverage Not relevant	Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide(N ₂ O), Perfluorocarbons (PFCs)		+
	Target type Clean energy target only, no emissions reduction target	Emissions reduction below business as usual scenario		+
	Clarity of implementation plan The first NDC includes a list of economic diversification measures "with mitigation co-benefits" in key sectors. These measures are implemented at sub-national, emirate level (mostly in Dubai and Abu Dhabi).	The second NDC includes a somewhat more comprehensive list of mitigation strategies and policies in key (sub-)sectors. It also mentions the new inter-emirate and federal governance structures for implementing climate policy. All seven emirates participate in these processes.		+
	Explanation why the target is a fair contribution towards the global goal No	There is a section justifying the fairness and ambition of the target in the second NDC, but it does not provide a clear explanation as to how this target is a fair contribution with regards to the long-term temperature goal of the Paris Agreement.		
	Followed guidance on information to facilitate clarity, transparency and understanding of NDCs in Decision 4/CMA.1 Not applicable	No. While reference to the guidance is made, some elements are missing, including transparency on the sources used to calculate the BAU scenario, the GWP values and assumptions around LULUCF.		

*While it is not mentioned in the NDC, we assume the BAU value to be expressed in the IPCC's Second Assessment Report (SAR) Global Warming Potentials (GWP), in line with previous documents submitted by the UAE to the UNFCCC.

**Calculated in AR4 GWP

Table 8: Comparison of NDC Targets

Table 9: Main elements of First Qatar's NDC (2015)

Qatar is attempting to increase the proportion of solar energy in the domestic energy mix and decrease the amount of natural gas consumed for water desalination projects and power generation. The NDC is also focused on the environmental risk that Qatar suffers from in the event of significant global temperature increases. The Qatari NDC is intended to generate mitigation co-benefits through its macro-economic diversification strategy.
Copenhagen Pledge 2020 Target: None
Paris Agreement Target: Yes
Ratification: Yes (June 23, 2017).
Mitigation Target: Focus on Economic diversification with mitigation co-benefits.
Land Use, Land Use Change, and Forestry: Not Mentioned
Long-Term Goals: None (however, other official government announcements indicate a plan for 1,800 MW of solar energy production by 2020 with 10 GW produced by 2030).
Energy Efficiency: References Qatar's various energy efficiency projects but indicates that the existing capacity is not enough to support upgrades.
Clean Energy and Renewables: Focus upon investments in LNG, which has a lower carbon intensity than oil and coal, and current or proposed investments in wind and solar energy with a view of exporting solar-generated electricity throughout the region at a future date. Stresses that technology transfer is required to increase deployment.
Research and Development: Investment in research and development in renewable energy technology and climate change adaptation.
Education: Focus on increasing human resources and capacity building in the youth demographic to promote environmental awareness.
Tourism: Promotion of sustainable tourism to reduce reliance on hydrocarbon resources.
Water Management: Initiation of policies to increase water conservation and renewable energy-powered desalination plants.
Infrastructure and Transportation: Significant investment in public transportation and the domestic road network.
Source: Qatar INDC (2016)

Table 10: Main elements of Qatar's Second NDC (2021)

Reference base year: 2019
Target year: 2030
Sector coverage: Economic diversification & Adaptation Measures with Mitigation Co-Benefits: Energy including transport & downstream industries; building & construction industry, water management, waste, and infrastructure.
Emission reduction ambition: The reduction of 25% in GHG emissions for the year 2030, relative to the BAU scenario, is consistent with provisions stipulated in Articles 4.3, 4.4, and 4.7 of PA. Also, Article 6 is considered in the implementation.

BAU and NDC target scenarios: The BAU scenario starts in 2019 and considers mitigation measures implemented by the State of Qatar until the end of 2019. The NDC target scenario represents a deviation from the BAU, accounting for implemented and planned measures for the period 2020- 2030.

Consistency with IPCC guidelines and methodologies Greenhouse gases covered: Carbon dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O). Nationally Determined Contribution (NDC) 3 Methodologies to be followed are based on the 2006 IPCC Guidelines.

Fairness and ambition of NDC based on national circumstances: Qatar is a low GHG emitting country. Historically it has been actively participating in the global efforts to address climate change by providing cleaner natural gas fuels to the global energy market, thereby reducing the global consumption of carbon-intensive alternatives. The Qatari economy is highly dependent on natural gas export revenues. This makes Qatar vulnerable to the negative impacts of response measures and the effects of climate change and its adverse impact (Art. 4.8 of the Convention).

Contribution to the accomplishment of the objective of Article 2 of the convention: Through the mitigation measures by 2030 and considering the socio-economic development objectives, Qatar will contribute on an equitable basis to achieving the objective of Article 2 of the convention.

Source: Qatar NDC (2021)