The Foreign Relations of Energy Transitions – Framing the Issue for the UAE

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Executive Summary

◊ The transition towards a more sustainable global energy mix will influence global geoeconomics and politics and shape countries’ foreign relations. There is a growing interest in understanding better both the forces that shape this transition and the implications it could have on different countries.

◊ The number of factors and actors involved in the transition complicates future predictions. While projecting its exact pace and direction is not possible, it is generally agreed that the global energy transition will be driven by a mix of technological and market forces, science, policy and consumer preferences. The major defining characteristics of the global energy transition will include uncertainty, abundance, variability and decentralisation, largely driven by electrification and the increasing uptake of renewable energy.

◊ Despite a general recognition that hydrocarbon export revenue-dependent countries are likely to benefit comparatively less from the energy transition, few studies have examined this challenge from the perspective of the oil-exporting countries themselves – let alone that of their foreign relations. The issue is much more nuanced than generally assumed.

◊ The main transition risks to Gulf oil exporters relate to loss of market share, price volatility, loss of export revenue and jobs, and stranded assets. Economic diversification remains the best counterstrategy to mitigating the risks related to the negative impacts of declining oil demand and prices. A large part of the policy agenda therefore is domestic and entails actions in three areas: diversifying within the oil and gas industry and increasing its efficiency; strengthening both energy and non-energy clean/green industries; and cleaning the domestic energy mix.

◊ This EDA Insight is the first in a series of four briefing papers that examine the ‘foreign relations of energy transitions’ from the United Arab Emirates’ (UAE) perspective. This paper frames the overall challenge for the UAE and other Gulf Arab energy exporters which, due to structural similarities, will be facing many of the same external challenges. It also looks at the UAE’s own domestic energy transition and explores how the UAE is currently positioned in the global energy transition.

◊ The Insight identifies three interests the UAE has vis-à-vis the transition: remaining a global energy supplier; ensuring that domestic energy targets can be met; and ensuring economic prosperity through a diversified economy.

◊ The main economic challenges to the UAE in the context of the transition relate to: maintaining or increasing oil exports at competitive prices long enough, while increasing the share of higher value oil-based exports to enable a stable transition in terms of government revenue and the broader economy; and meeting domestic energy demand growth without compromising on environmental sustainability.

◊ There are also foreign policy opportunities for the UAE in the context of the transition. The other three papers in this series will each examine a different dimension of foreign policy that will be affected by the energy transition, with an eye on related opportunities. These are:
  o Bilateral relations, specifically building on existing ties with the UAE’s current energy export destination countries, some of which (China in particular) are becoming major players in renewable energy and clean technologies;
  o Regional relations, namely leveraging the opportunities of regional electricity trade and related economic interdependencies, which can help boost regional stability; and
  o International cooperation around the UN Sustainable Development Goal (SDG) 7 (on affordable and clean energy), namely promoting clean energy industries domestically and sustainable energy deployment and energy access in the MENA region and beyond.

◊ Finally, this Insight argues for the need for governments in the region to develop outward-oriented and comprehensive ‘energy diplomacy strategies’ that build on domestic energy agendas, address these opportunities and challenges and proactively engage with a world that is moving away from hydrocarbons.
The Issue

How will the global energy transition change international relations? Both scholars and practitioners worldwide are demonstrating growing interest in understanding how the transition towards a more sustainable global energy mix will influence global geoeconomics and politics and shape countries’ foreign relations.

The number of factors and actors involved in the transition complicates future predictions. Analytical challenges related to answering this question derive from the difficulty of foreseeing the pace of technology development and of related ‘disruptors’. Also, different countries with different national priorities will inevitably transform their energy consumption and production at different paces.

Despite a general recognition that hydrocarbon export revenue-dependent countries are likely to benefit comparatively less from the energy transition, few studies have examined this challenge from the perspective of the oil-exporting countries themselves — let alone that of their foreign relations. The issue is much more nuanced than generally assumed.

Similarly, outward-oriented ‘energy diplomacy strategies’ that would build on domestic energy agendas and proactively engage with a world that is moving away from hydrocarbons do not yet feature strongly in on the Gulf Cooperation Council (GCC) countries’ policy agendas. However, such approaches are worth looking into.

This EDA research project aims to start bridging the above-described gaps in analysis by generating timely, policy-oriented research that is relevant for the UAE and for its neighbouring region. The project presents the case for countries of the Gulf region to develop approaches that integrate energy into foreign policy and that dynamically respond to the global energy transition and its inherent unpredictability.

This series comprises four EDA Insight policy papers. This first paper frames the challenge for the UAE and other Arab Gulf energy exporters which, due to structural similarities, will be facing many of the same external challenges. It examines the UAE’s position in the global energy transition going forward by presenting an overview of: (i) the broad drivers and characteristics of the transition; (ii) expected impacts of the transition on Arab Gulf hydrocarbon exporters; iii) the UAE’s energy profile and policies. After laying out the main linkages between the energy transition and foreign policy, the paper draws some initial conclusions on (iv) the UAE’s energy transition ‘outlook’, as well as its interests, challenges and opportunities vis-à-vis the global transition.

Drivers and Characteristics of the Global Energy Transition

In addition to technological and market forces, the global energy transition will involve a host of other drivers. These include the environmental pressures of climate change and air pollution. Science, policy and consumer preferences will also play a role. Predicting the exact pace of and direction of the transition is not possible and both fore- and backcasting studies are notoriously bad in predicting the future. (See Box 1 for a discussion on the differences between forecasting and backcasting.)

Drivers

There is some agreement on the major drivers that will shape the production and consumption of energy in the years and decades ahead. These include ones related to socioeconomic and technological development, as well as policy.

Socioeconomic development: population growth (resulting in a population of 9 billion by mid-century), urbanisation and rising living standards are the major drivers for overall energy demand through 2040. Of these, affluence has the highest impact on energy demand. In regional terms, developing countries in Asia, particularly India, are expected to account for two-thirds of the absolute global demand growth through 2040 and the Middle East and Africa for more than a fourth.

China’s shift toward a more service-oriented economy, combined with policies aimed at combatting air pollution will drive the adoption of more efficient technologies, electrification and the uptake of cleaner sources of energy. Many of these drivers also apply in the Middle East. In this region, Saudi Arabia is expected to lead in investments across the sector, from oil and gas to renewables.

At the same time, a study by the World Energy Council (WEC) predicts global capita energy demand to peak

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Energy Transitions

Box 1: The Need for a Proactive Approach to the Energy Transition – Forecasting and Backcasting

When analysing energy transitions, it is important to recognise that different approaches to the issue can result in widely diverging analyses and results. These approaches generally fall into two broad categories.

First, the energy transition can be seen as the result of an interplay of technological development, market forces and, to some extent, global politics. This viewpoint is often taken by conventional energy market analysts who seek to forecast energy production and demand for different energy sources into the future. Such projections are often linear, build on the ‘business as usual’ and have no normative dimension. This approach to predicting the transition is taken by many international oil companies and energy agencies, such as the International Energy Agency (IEA) (which also uses backcasting) or the Organization of the Petroleum Exporting Countries (OPEC).

Another way to examine the energy transition is to treat it as an end in itself. This perspective views the transition as something to be actively pursued with the purpose of preventing dangerous global warming or improving air and environmental quality. This approach requires a backcasting approach, because the end goal is fixed, for example limiting global warming to 2°C. This approach is adopted by climate scientists and some energy agencies, such as the International Renewable Energy Agency (IRENA) but also the IEA. It often involves the analysis of different possible pathways and assumes an active role for policy. Analyses taking this approach sometimes refer to energy transformations and often include evaluations of different policy options.

Science clearly demonstrates the disastrous consequences of not limiting global warming to safe levels. This means that there is a ‘carbon budget’ for all humanmade greenhouse gas emissions – two-thirds of which currently come from fossil fuel combustion. This paper argues that a backcasting approach to the energy transition is necessary for a safer future for humanity and for a managed transition. At the same time, it is important to remain aware of the major energy forecasters’ projections since these continue to shape investment decisions worldwide.

before 2030, driven by technological and policy-led efficiencies.7

**Technological development:** The cost of clean energy technologies has been declining rapidly in recent years and, consequently, the pace of their deployment is expected to keep increasing.8 IRENA has estimated that renewable energy and energy efficiency improvements could account for 90% of the energy-related emission reductions needed to prevent a runaway climate change through 2050. This would require the global non-renewable energy supply to shrink to less than half of 2015 levels while the renewable energy supply would need to increase fourfold.9

Diminishing global coal demand will give way to cleaner fuels. Of the two biggest coal consuming countries, China’s consumption seems to have already plateaued and India may reach a peak as soon as the next decade.10

Estimates on future oil demand vary significantly depending on different weights given to the impacts of policy, economic growth and electric vehicles technology uptake, among others. At one end of the spectrum, Exxon, OPEC and some scenarios by the US Energy Information Administration, the IEA and Equinor (formerly Statoil) do not expect a peak before 2040. At the other end, other scenarios by IRENA, IEA and Equinor place this peak at around 2020.11 Some argue that demand is likely to decrease at very slow rates after the peak.12

Electrification is also among the major drivers in global energy patterns: the IEA predicts that electricity is expected to account for 40% of the global growth in final consumption through 2040.13 There is high uncertainty regarding the impact of so-called technology disruptors, primarily energy storage technologies, on the pace of electrification.14

**Decarbonisation policies:** The ‘planetary boundary’ of climate change sets a relatively clear target for policies – as reflected in the political agreement on the ‘well below 2°C’ target enshrined in the Paris Agreement on climate change. In 2014, the Intergovernmental Panel on Climate Change (IPCC) popularised the concept of the ‘carbon budget’ (see Box 1). It has since become commonly accepted among governments that in order to have a reasonable likelihood of staying ‘well below’ 2°C of global warming, as much as two-thirds of global fossil fuel reserves would need to remain unexploited.15

The implementation of current emissions reductions pledges by governments under the Paris Agreement would result in 3°C or more of global warming. However, the agreement incorporates a mechanism by which
countries are expected to ramp up their pledges every five years, in order to eventually reach the agreement’s temperature and emissions goals.

**Characteristics**

Uncertainty, abundance, variability and decentralisation are among the major characteristics of the global energy transition. First, the difficulty of predicting the pace of the global energy transition is one of its major characteristics. The direction of technological development is hard to predict, but so are the uptake of technologies, energy demand growth rates, government policies and consumer choice.

The second major characteristic is the shift from a perception of scarcity in the energy market to abundance. In the oil markets, the US shale revolution has shifted the perception of energy security, in particular in the US, from scarcity to abundance. Abundance is also a characteristic that sets renewables apart from oil and natural gas. These latter are geographically concentrated, require management by large companies and are conducive to oligopolistic markets. Renewables, in turn, can be produced in practically all countries of the world and at different levels – individual consumers becoming ‘prosumers’ through rooftop solar installations constitutes merely one example.

Finally, intermittency and decentralisation, which are two key characteristics of renewables, will become increasingly salient. Intermittency will require smarter and more sophisticated management of complex systems, including across national boundaries. On the one hand, renewable energy allows for less centralised energy distribution and, consequently also, a democratisation of the energy system. On the other, long-term losses in electricity transmission and distribution, and vulnerability to cyber attacks will remain challenges for grid-based systems – unlike for liquid fuels.

**Impacts of the Transition on Arab Gulf Hydrocarbon Exporters**

How will Arab Gulf oil and natural gas exporters be affected by the global energy transition? Despite the magnitude of the forthcoming challenge for the GCC countries, the picture presented by analyses so far remains fragmented.

Creating a coherent narrative is partly hindered by the fact that discussions often happen in two silos that do not interact: one group of experts is concerned with producing market analysis for the region’s conventional energy industries and generally adopts a conservative projective approach to forecasting future energy trends.

Another group, generally associated with the renewable energy industry and different climate change stakeholders, is focused on a normative approach that tries to keep the world within the global carbon budget in order to ensure a ‘safe operating space’ for humanity. The key question for Arab Gulf hydrocarbon exporters is obviously how and at what pace the transition to cleaner sources will impact oil and natural gas demand and prices globally. In addition, there is an obvious question around how these countries should position themselves so as to benefit as much as possible from the transition, which they to a large extent will not be able to control.

Most projections converge on fossil fuels remaining a part of the global energy mix for many decades, not least because of their high current shares: in 2016, hydrocarbons still accounted for 81% of the total global primary energy supply. The fact that demand for oil or natural gas has not yet peaked led some to suggest that ‘energy addition’ best describes the trend through to the present.

Given the high degree of uncertainty, the first question can be approached by identifying key oil and gas-related transition risks and challenges for the GCC countries, which include:

- **Loss of market share:** Competition from other fossil fuel producers, in particular the US, within the oil and gas market is a major medium-term concern for the GCC countries. Over time, as global oil demand plateaus and peaks, competition for market shares will increase further.

- **Price volatility:** As long as the GCC economies remain dependent on oil revenue, price volatility presents a major risk to their economic stability. First, there are significant uncertainties around future investment in the oil and gas sector: pension funds and asset managers are less and less likely to invest in fossil fuel companies given the perception of an imminent peak in global demand. In terms of production capacity, there is also concern that insufficient investment given uncertainties around future demand could result in price hikes in the near future. Further, some see a risk that the ‘wide divergence in projections of energy market shares’ results in a ‘disorderly transition characterized by increased price volatility, impacting the global oil market in particular’.
• **Uncertainties around natural gas demand:** Furthermore, it is important to keep in mind that the dynamics for natural gas differ greatly from those of oil. Recent years’ dramatic decreases in renewable energy technologies are beginning to contest the mantra of the previous decade about natural gas being the long-term ‘bridge fuel’ in the transition.

• **Loss of export revenue (and jobs):** Studies by IRENA suggest that hydrocarbon export revenue-dependent countries are likely to benefit comparatively less from the global energy transition than other countries, with the negative impacts being proportional to the levels of hydrocarbon revenue dependence of their economies.25

A study by Saudi-based research institute KAPSARC concluded that GCC countries are better-placed in the transition than high-cost oil producers, but are ‘still exposed to fiscal risks if they do not diversify from reliance on hydrocarbon revenues’.26 Two GCC countries, namely Bahrain and Oman, however, will arguably be affected less than the others by the energy transition given their smaller oil reserves and consequently shorter oil production horizons.

• **Stranded assets:** There are few quantitative studies of economic implications of the shift to cleaner energy sources for hydrocarbon exporters.ii The best-known is a study by McGlade and Ekins who suggest that staying below 2°C, by 2050, could translate to leaving 263 billion barrels of oil in the ground in the Middle East, or 38% of the region’s reserves and 61% of its natural gas reserves.27 Calculating or predicting the exact shares of the carbon budget for each hydrocarbon producer, however, is arguably more useful as a conceptual tool than an economic projection – not least because a top-down allocation of production shares is totally inconceivable (as demonstrated by the failed attempts to create a top-down global regime for emissions reductions).

Despite the high uncertainties around the speed at which these risks could materialise, their high impact on non-diversified exporters is significant. This means that the faster the GCC countries diversify their economies, the more resilient their economies will be. The eventual decline in global oil demand (and prices) is likely to intensify the speed of existing diversification efforts in the region.iii

Economists generally agree that the best counterstrategy to mitigating the negative impacts of declining oil demand/prices for oil-exporters is economic diversification. At the same time the GCC countries need to ensure competitiveness in an increasingly carbon-constrained world. A large part of the policy agenda therefore is domestic and entails diversification in three areas:

- **The brown economy:** diversifying within the oil and gas industry and increasing its efficiency;
- **The green economy:** strengthening both energy and non-energy clean/green industries; and
- **The energy mix:** cleaning the domestic energy mix.

### The UAE’s Energy Profile and Policies

Other papers in this series examine how the UAE and GCC countries are likely to be impacted by energy transitions in other countries and how they can respond to related challenges and opportunities through foreign policy and diplomacy. However, there is another important dimension to address, namely the UAE’s own energy transition. This section zooms in on the UAE, presenting the country’s energy profile and policies, and examining how it is aiming to make its own energy transition.

The UAE has for decades functioned as a key energy supplier in the international system. Its energy resources have fuelled industrial growth and enabled low domestic energy prices. With the world moving away from oil and with the UAE’s domestic energy demand – still fuelled by oil and natural gas – projected to keep growing for the foreseeable future, the country is seeking to diversify both its domestic energy mix and energy exports.

### Energy Mix, Exports and Imports

Currently, the UAE’s domestic energy mix is dominated by fossil fuels, comprised of 81% of natural gas, 16% of oil and 2% of coal.28 iv Renewables account for less than one percent of the total primary energy supply. Most

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ii One exception is the some now outdated studies on the expected impacts of the implementation of the Kyoto Protocol emission reduction targets by industrialised countries on OPEC countries’ economies.

iii However, one study has suggested that social costs (healthcare, education and public employment) in major low-cost oil-producing countries, which cannot be cut back rapidly, will have an important impact on oil prices because this will delay the emergence of a more competitive oil market. See: Spencer Dale and Bassam Fattouh. *Peak Oil Demand and Long-Run Oil Prices*. OIES Energy Insight 25. Oxford Institute for Energy Studies, January 2018.
of the country’s electricity is generated from natural gas. The UAE exports two-thirds of its oil production, principally to Japan, Singapore, China and other Asian countries. The UAE also exports liquefied natural gas, mainly to Japan, but it is a net importer of natural gas, with net imports totalling approximately 18% of the total natural gas supply.\(^9\)

In the near term, the following developments and trends are expected to mark the UAE’s energy trajectory:\(^{10}\):

- **High energy demand growth** is expected to continue, with estimates on the rate varying (the government’s own estimate is 7–10% per year through 2020);

- **Per capita consumption levels can be expected to remain high**, driven by economic growth and reliance on air-conditioning and desalinated water (in 2016, the UAE’s per capita electricity consumption was 13 MWh while the global average was a little over 3 MWh);

- **In the power sector, natural gas** will remain the main source of power generation for the foreseeable future. **Nuclear energy** will enter the power sector energy mix in the coming years, and **energy efficiency** and the share of **renewables** can be expected to increase from current levels, albeit at a moderate pace (a 50% clean energy by 2050 target, however, is in place for the power sector);

- **Progress in economic diversification** away from reliance on oil export revenue can be expected to continue measured both in terms of share of GDP and share of government revenue (these two figures were estimated to at 30% and 54% in 2017, respectively);

- **In the area of energy exports**, recent announcements by ADNOC indicate plans to significantly increase oil production capacity over the next decade and to invest in the development of domestic natural gas resources to meet domestic demand

### Energy Policies and Strategies

The UAE has in place relatively clear medium and long-term diversification plans for its domestic energy mix, in particular the power sector. Plans have been less articulated (at least in public) with regard to diversification of the oil and gas sector and related industries.

Policy development for the domestic energy supply and demand is led at the federal level by the Ministry of Energy and Industry (MoEI). The UAE’s energy governance overall is relatively fragmented due to the federal structure and the high level of autonomy that individual emirates enjoy in developing their natural resources. In Abu Dhabi, which accounts for the majority of the UAE’s hydrocarbon reserves, the oil and natural gas sector is governed by the Supreme Petroleum Council.

The UAE has energy-relevant development plans at two levels: federal and emirate-level. At the federal level, the UAE’s Energy Strategy 2050, from 2017, is presented as the country’s ‘first unified energy strategy’ that addresses both the supply and demand sides of energy. It sets the following UAE-wide targets:

- **For total electricity generation capacity** by 2050: 44% renewable energy; 38% natural gas; 12% ‘clean coal’; and 6% nuclear energy.

- **For energy efficiency**: 40% improvement in energy efficiency in all sectors compared to a business as usual trajectory by 2050;

- **For carbon dioxide (CO\(_2\)) emissions**: a 70% deviation in CO\(_2\) emissions from power generation by 2050 compared to a business as usual trajectory; and

- **Investments**: AED600 billion invested in the sector by 2050. At the same time, the power sector diversification measures are expected to save AED 700 billion over the same period.\(^{31}\)

In addition, the UAE’s first nationally determined contribution (NDC) to the Paris Agreement contains a clean energy target of 24% by 2021. In 2016, the target was raised to 27%. This is presumed to be a target for electricity generation and contingent on Abu Dhabi’s four nuclear reactors (with a total capacity of 5.6 GW) coming online by 2021.\(^{32}\)

\(^{9}\) Media reports indicate that the coal is consumed by the cement industry. See e.g.: Reuters, ‘UAE Cement Firms Turn to Coal’, Arabian Business, 24 June 2007.

\(^{10}\) Notably, government sources from 2017 consistently refer to a 44% ‘clean energy’ target. However, a report from 2018 published jointly by EWS-WWF and the Ministry of Energy and Industry refers to a 44% renewable energy target. Also, publicly available government documents refer to ‘the energy mix’ whereas officials from the Ministry of Energy and Industry have confirmed that the energy technology targets are in reference to electricity generation capacity and the efficiency and emissions targets are based on a ‘business as usual’ scenario that takes 2013 as its base year. // According to Dubai Government sources, the strategy is based on economic growth rates of 6% per year. Dubai Media Office, ‘Mohammed bin Rashid Unveils UAE Energy Strategy for the Next Three Decades’, Press release. 10 January 2017.
Notably, there are currently no national-level energy or emissions strategies or targets that would cover the entire energy mix. This is striking when keeping in mind that electricity only accounts for 19% of the UAE’s total final consumption of energy.33

A number of efficiency-oriented policy instruments are being implemented in non-electricity sectors, including a transport fuel tariff reform, rolled out in 2015. Strong demand side management policies, however, are still absent: one example is public transport, where further investments are needed to encourage a modality switch among a large segment of consumers. Box 3 presents the energy plans for the two major emirates, Abu Dhabi and Dubai.

In terms of oil exports, Abu Dhabi, which has approximately 95% of the UAE’s proven oil reserves (estimated to stand at 98.7 billion barrels in 2017, accounting for 6% of the world’s proven reserves), is not facing a risk of peak production unlike the other emirates. ADNOC has in place a crude oil production target of 3.5 million barrels per day (mbpd) by 2018, which will be achieved mainly through enhanced oil recovery. In November 2018, the company announced new production targets, of 4 mbpd by 2020 and 5 mbpd by 2030, and a strong drive to develop Abu Dhabi’s natural gas reserves.34

At the same time, ADNOC is pursuing an ambitious diversification strategy. The company’s 2030 strategy is based on three goals: more profitable upstream; more valuable downstream; and more sustainable and economic gas supply. Over the past decade, ADNOC has doubled its refinery throughput. It currently plans to increase gasoline production and to triple petrochemicals production from current levels by 2025.35

There is also a wide range of major international companies involved in the UAE’s oil and gas sector, including BP (UK), Shell (UK-Netherlands), Total (France), ExxonMobil (US) and Occidental Petroleum (US) and, more recently, Inpex (Japan), GS Energy (South Korea), CNPC (China) and CEFC (China).36

At the time of writing, the Ministry of Energy and Industry was undertaking an evaluation of greenhouse gas abatement potential.

**Box 2: The UAE’s Energy Governance**

The following entities are among the main government entities with mandates that directly relate to energy:

- **Ministry of Energy and Industry**: plays a coordination role in the energy sector, including regulating transport fuel pricing (and the related deregulation policy in place since 2015) and national target-setting for clean energy; it has as its aims the security, sustainability and competitiveness in the UAE’s energy, water and mineral wealth sectors;

- **Ministry of Climate Change and Environment**: is the lead government entity on climate change policy; it coordinates with other government entities responsible for a variety of related issues;

- **Ministry of Foreign Affairs and International Cooperation**: leads on the UAE’s foreign relations vis-à-vis other countries and international organisations. Energy features as a major component of many of these relations. The Ministry also coordinates the UAE’s foreign assistance, which includes energy-related assistance across the world;

- **Dubai Supreme Council of Energy**: is the leading energy body of Dubai, in charge of developing policy, planning and coordination;

- **Abu Dhabi Department of Energy**: was established in 2018 under the Abu Dhabi Executive Council and has the mandate to develop and implement energy policy in the emirate;

- **Abu Dhabi Supreme Petroleum Council (and ADNOC)**: is comprised of a number of prominent government figures, and both governs the oil and gas sector of the emirate and functions as the Board of Directors of the Abu Dhabi National Oil Company (ADNOC).

There are no plans as of yet for exports of non-hydrocarbon energy, and no plans for energy imports (going beyond what is currently in the pipeline in terms of natural gas and coal) are available in the public domain. The UAE is part of the GCC Interconnection Authority, through which small quantities of electricity are traded at present, and which holds significant potential for both exports and imports going forward.

In terms of securing clean technologies and building new partnerships around clean energy, over the past decade, the UAE has engaged in both investment and international assistance. The former has been mainly led by Mubadala (Abu Dhabi’s primary vehicle for strategic energy sector investments) and Masdar (Abu Dhabi-owned energy company). The latter is coordinated by the Ministry of Foreign Affairs and International Cooperation. Masdar has to date invested approximately US$2.7 billion in renewable energy projects in the MENA region and beyond.

In the area of development cooperation, the UAE has established three funds that support renewable energy in developing countries – the ADFD-IRENA Project Facility, the UAE-Pacific Partnerships Fund, the UAE-Caribbean Renewable Energy Fund – and also supports IRENA beyond its core contributions. Cumulative assistance to renewable energy projects totals close to US$1 billion. In 2016, 3% (US$206 million) of the UAE’s foreign aid went to projects supporting the Sustainable Development Goal (SDG) 7, the components of which are renewable energy, energy efficiency and energy access.

Foreign Relations of Energy Transitions

So what role can foreign policy play in supporting the UAE and other GCC countries in positioning themselves beneficially both in their own domestic energy transitions and vis-à-vis the global energy transition? This section first examines existing literature on the interlinkages of foreign policy and energy transitions and then identifies three areas of particular relevance for the UAE and its neighbours.

The global energy transition will have significant implications for foreign policy and diplomacy through the changes it generates in a number of areas. These include global energy markets and governance, countries’ position as exporters or importers, their role as technology developers or buyers, electricity interconnectivity among countries, and other forms of bi- and multilateral cooperation around energy.

The rise of sustainable energy is already impacting the form of multilateral cooperation around energy – the IRENA being just one example. Transitioning to a more diverse energy mix will also cause fundamental changes to regional dynamics of competition and cooperation across the world. Furthermore, energy transition creates the need for new areas and approaches in foreign policy and development cooperation. These include renewable energy trade diplomacy or the integration of clean energy and energy access into development and humanitarian assistance.

Box 3: Energy-related Plans and Policies of Abu Dhabi and Dubai

**Abu Dhabi**: The Department of Energy is working on an emirate-level energy strategy that will be aimed at supporting the emirate’s Vision 2030 development plan, which aims to reduce economic dependence on oil revenue and move towards knowledge-based industries. In 2009, Abu Dhabi authorities announced a 7% renewable energy power sector capacity target for 2020.

**Dubai**: Dubai’s Clean Energy Strategy 2050 sets a 75% ‘clean energy’ target for 2050, and the following targets for 2030: 25% solar energy, 7% nuclear power, 7% ‘clean coal’ and 61% natural gas. The targets are presumed to be for the power sector given that oil does not feature as a source.

The Strategy’s aim is to position Dubai as a ‘global centre of clean energy and green economy’. It has five focal areas: infrastructure (including a 5 GW solar park implemented by 2030); supportive legislation; funding (including loans through an AED100 billion Dubai Green Fund); building capacities and skills (including through cooperation with international organisations, companies and research institutions); and an environmentally friendly energy mix.

The first substantial studies of the interactions of foreign relations with energy transitions only date back a few years, but a number of authors have pointed out the inherently different dynamics between the international relations of hydrocarbons, characterised by ‘traditional energy geopolitics’, and those of renewable energy, driven by international cooperation to address climate change.40

Renewable energy systems will also require greater international regulatory cooperation and intensified regional cooperation (which in turn can have a stabilising impact through growing interdependence).41 Furthermore, support through international cooperation to sustainable energy access can have a significant stabilising role in poor regions, particularly Africa, through the economic growth it enables.42

However, at the same time, there is a recognition that an increasingly renewable energy and electricity-dominated energy mix will inevitably also have geopolitical consequences. In 2018, IRENA launched a commission to study ‘the geopolitics of renewable energy’, which will present its findings in early 2019. So far, experts have identified a number of ‘mechanisms’ through which renewables could interlink with geopolitics, with potential negative consequences:

- Possible geopolitical tensions related to critical material supply chains, e.g. rare earths and related oligopolies;
- Competition over clean energy finance or technologies, including tensions over their transfer into developing countries;
- Supply vulnerabilities in increasingly electricity-dependent systems, including involuntary technical problems, or ones motivated by political or security motives of terrorism – of particular concern to import-dependent countries; and
- Destabilising economic changes in both existing and new energy exporting countries, including the danger of a ‘new resource curse’ in renewable energy exporting or material supplier countries, and changes in terms of their global/regional status (including the rise of the US and decline of a number of oil producers).43

Of these, perhaps the most important geopolitical challenge to the GCC countries resulting from the global energy transition is the possibility of loss of government revenue and geostrategic significance in line with that of oil in the world economy. However, as Dr Steve Griffiths argues in his contribution to this series, the GCC countries could maintain their economic strength and relevance if they manage to position themselves as the main suppliers of hydrocarbon and hydrocarbon products to demand growth markets in Asia, and to leverage their energy relationships to build capabilities that support economic diversification. Energy diplomacy, in its various forms, has a key role to play in this.

International cooperation on SDG 7 (on affordable and clean energy) is a further area that could help reposition the GCC countries in new economic sectors and ways on the regional and world map. Dr Johannes Urpelainen, in his contribution to this series, stresses the importance of increasing domestic renewable energy generation across the GCC. In terms of new economic sectors to explore, he suggests renewable energy finance as a strategic focus, for the UAE in particular. In addition, he proposes that GCC aid donors could make important contributions to energy access in the poorest countries, especially in Africa, by supporting access to clean cooking fuels, which remains a challenge on the road to fully achieving SDG 7.

As Laura El-Katiri will argue in her contribution to this series, the Arab Gulf and the wider MENA region could also stand to benefit from greater cooperation around electricity grids and trade, but this would necessitate the separation of energy from politics – which is never easy – and strong managerial-level cooperation. It would also require substantive efforts in harmonising national legislation and institutional structures.

Regional cooperation could also help increase energy efficiency and market efficiencies through the adoption of common efficiency and performance standards for appliance, transport fuels and smart grids, among others. Expanding the grid beyond the GCC to countries could have multiple benefits. In addition to having a larger and more diverse market, such an expansion could open up new areas for investment in countries like Egypt or could support state-building efforts in countries like Yemen.

40 In January 2018, IRENA launched the ‘Global Commission on the Geopolitics of Energy Transformation’, which has commissioned an expert group to examine existing literature and draw policy-relevant conclusions on ‘geopolitical implications of global energy transformation driven by large scale-up of renewable energy.’ The commission will present its report to the IRENA Assembly in January 2019.
The UAE amidst the Energy Transition: Interests, Challenges and Opportunities

This section concludes by answering two questions, related to the UAE’s own energy transition and to the UAE’s possible future roles in the global energy transition.

How is the UAE managing its own energy transition, and how is it currently positioned in the global energy transition?

The UAE is embarking on an ambitious diversification programme in its power sector. Experts estimate that the current renewable energy targets are achievable, and many argue that there is potential for higher ambition in this regard. In 2015, IRENA estimated that renewable energy had become economically attractive in the UAE. At present, solar photovoltaics are estimated to be competitive with all other fuel sources, not only in the UAE but GCC-wide, when measured on a real cost basis.44

In terms of sustainable energy, other domestic energy use sectors can be expected to come under examination in due course through a push for broader energy efficiency or greenhouse gas abatement policies. The UAE is unlikely to suffer from domestic energy insecurity in the medium or even longer term. However, in terms of positioning itself in the global energy transition as an energy exporter and sustaining economic growth, the UAE is faced with a number of tasks, most of which also apply to its major oil-exporting neighbours.

Global energy demand will keep growing for the coming decades, in particular in Asia. Electrification will transform energy systems worldwide, and renewable energy uptake will continue to grow – this can happen at an unprecedentedly fast pace, either due to technological breakthroughs or government policies. Coal demand may have already peaked and that of oil, and even natural gas, will eventually do so.

The future international relations of energy are likely to be marked by abundance rather than (a perception of) scarcity and, one can hope that they will be characterised more by cooperation than conflict. There will be both winners and losers. In this transitional phase, GCC countries should actively seek to secure their position as the former, taking advantage of their fossil fuel wealth to secure the technologies and critical materials needed for the energy and economic transition into cleaner sources. They should also invest in building regional connectivities that could foster a positive economic interdependence and energy security, both through power grids and investments.

Above all, the GCC countries should ensure that, if global oil demand peaks sooner than most analysts currently expect, their economies are sufficiently diversified to withstand possibly lower prices and higher market competition. In terms of hydrocarbon energy exports, they should further strengthen their position where energy demand still keeps growing, and they should continue to seek opportunities to turn this wealth into higher value through the petrochemicals industry.

Despite its fragmented domestic energy governance, the UAE specifically could create a mechanism to bring to the same table the various stakeholders whose policies and actions will be crucial in both achieving a successful transition in the UAE’s energy mix and economy and in positioning the UAE beneficially in the global transition.

The UAE could also strategically harness its foreign policy in support of its national, regional and global energy agendas. And, vice versa, its ‘energy power’ – energy output and technologies – could be used in foreign policy in new ways.45 For this, it is useful to define:

What would the UAE’s national interest vis-à-vis the global energy transition consist of, and what are some of the main related challenges and opportunities?

The UAE’s main interests could be described to be:

- Remaining a global energy supplier, including through developing both hydrocarbon and renewable energy-related export industries and investments. At present, renewable energy is arguably still seen more as ‘hedge’ for the future, with the main focus on using it for domestic supply security (avoiding costly natural gas imports) and some related green industries, rather than a major export-oriented sector;
- Ensuring that domestic energy targets can be met, including through securing supplies of critical materials and technologies; and
- Ensuring economic prosperity through a diversified economy, including through building clean energy industries that generate revenue and jobs, particularly through joint projects with leading technology suppliers and investments in clean technologies.
The main challenges to the UAE in the context of the transition in reaching these goals include:

- Maintaining (or increasing) oil exports at competitive prices long enough, while increasing the share of higher value oil-based exports to enable a stable transition in terms of government revenue and the broader economy; and

- Meeting domestic energy demand growth without compromising on environmental sustainability: securing necessary natural gas supply while not slowing down renewable energy deployment and energy efficiency improvements. Possible (although unlikely) further increases in coal power capacity without carbon capture and storage could challenge reaching energy sustainability goals.

The main opportunities to the UAE in the context of the transition in reaching these goals include:

- Building on existing ties with the UAE’s current energy export destination countries, some of which (China in particular) are becoming major players in renewable energy and clean technologies;

- Leveraging the opportunities of regional electricity trade and related economic interdependencies, which can help boost regional stability; and

- Supporting clean energy industries domestically and sustainable energy in the MENA region and beyond by engaging in global cooperation to support renewable energy and clean energy access in poorer countries.

The three other papers in this series examine these opportunities and the area of foreign policy and diplomacy in which they pertain – bilateral, regional and international. Each of the papers adopt a similar approach to the issue and include: an analysis of the expected changes in this area; an analysis of implications, in terms of the challenges and opportunities to both national interests and foreign policy priorities; and foreign policy recommendations.

It is the hope of the series editor that this project will contribute to expanding the debate on energy and foreign relations in the UAE and its neighbouring region, and will also help broaden the scope of the discussion on global energy transitions and the role of hydrocarbon exporters therein.
Endnotes

1. An article by Hölscher et al. examines the different applications and interpretations of energy ‘transition’ and ‘transformation’ among researchers. While noting that these are often used interchangeably, they also find that ‘transition’ is often used to refer to change from one societal regime to another whereas ‘transformation’ is used by researchers who examine shifts in human and environmental interactions. Katharina Hölscher et al. ‘Transition Versus Transformation: What’s the Difference?’, Environmental Innovation and Societal Transitions, vol. 27 (2018), pp. 1–3.


5. Ibid.


10. The absolute volumes of coal in the global energy mix have been declining since 2013. See e.g.: Qi Ye. ‘China’s peaking emissions and the future of global climate policy’. Planetpolicy, 12 September 2018; Kiran Stacey. ‘India to Hit Peak Coal Demand Faster than Expected, Says Report’. Financial Times, 21 November 2017.

11. Adam Sieminski. ‘Global Oil Demand Forecasts Vary Widely’. Graphic in a Tweet, 9 September 2018; and presentation in Abu Dhabi in September 2017. IRENA’s below-2 °C pathway would require the peaking of both oil and natural gas demand around 2020 and 2025–2030, respectively. IRENA. Global Energy Transformation, p. 27.


32. MoCCAE. National Climate Change Plan of the United Arab Emirates 2017-2050, p. 34.


