

THIRD IEF-EU ENERGY DAY INTRODUCTORY PAPER



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THE ECONOMICS OF NEW ENERGY TECHNOLOGIES LESSONS LEARNT AND FUTURE VISIONS FOR COOPERATION BETWEEN EUROPE AND THE GULF

RIYADH, SAUDI ARABIA | 26 FEBRUARY 2019

Introduction

In the age of disruption and the promise of transitions, energy pathways show greater variation due to different policy priorities in OECD and non-OECD economies, and the varied potentials of new energy technologies in different market settings across regions. Dialogue between the Gulf and Europe on future visions creates deeper collective insight on evolving policies and regulations on which the viability of both existing and new energy technologies, and the competitiveness of the economies they empower depends. Here the OECD region is committed to sustainability, whereas the Non-OECD region is focussed on responsible growth.

Dialogue has sharpened focus on the dynamic impact that industry transformations and energy transitions, envisioned over longer time horizons, have on energy market stability and related investment and trade incentives in an inherently less predictable policy environment.¹ Partnerships between energy exporting and importing economies on the benefits and burdens of maintaining market stability has become more forward looking as a consequence.² Engaging government and industry stakeholders on the IEF platform sheds light on policy objectives and technology pathways. The foresight gained works to advance smart transitions (orderly and timely) and maintain energy security by enabling investment and trade to move forward unhindered among regions.

With new energy technologies from renewables to unconventional oil and gas production achieving market parity, and the need to advance inclusive and sustainable growth in an emission constraint world, the Third IEF-EU Energy Day aims to:

- Take stock of developments in respect of renewable energy deployment, and the full spectrum of other new energy technologies, including, carbon capture use and storage (CCUS), hydrogen, LNG, nuclear, energy efficiency, efforts to convert waste to energy in cyclical resource management schemes.
- Consider their viability in the context of recently adopted policy visions that aim to transform energy matrices and modernise economies in both Europe and the Gulf.
- Uncover synergies among technologies and opportunities for cooperation that facilitate investment, trade, research and knowledge sharing to accelerate their roll-out along reasonable and reliable pathways that allow world economies to thrive.

¹ OIES (2019), 'Energy Transition, Uncertainty, and the Implications of Change in the Risk Preferences of Fossil Fuel Investors', Fattouh, B. et alia, Oxford Energy Insight, 45, January.

² IEF (2018), 'Energy Security as a Global Partnership', IEF Dialogue Insight Paper for the Second Ministerial and High-Level Session of the 11th Arab Energy Conference, IEF, Marrakech, October 2018.

From Vision to Viability in the Gulf

According to the International Renewable Energy Agency (IRENA) over the next decade the countries of the Cooperation Council for the Arab States of the Gulf (GCC) could save 354 million barrels of oil equivalent reducing demand by 23%, create more than 220,500 jobs, and limit the power sector's carbon dioxide emissions and water withdrawal by 22% and 17% respectively, if already adopted renewable targets to 2030 and other conditions are met.³ Recent ambitious announcements on the deployment of renewable, and other technologies, such as nuclear, are generally motivated by the need to:

- Respond to growing energy demand in the Gulf region more optimally,
- Diversify and modernise resource dependent economies, as well as
- Contribute to global greenhouse gas emission reduction, and sustainable development goals.

These are also made possible by the rapid cost reductions in the levelised cost of energy for such technologies in the low oil price environment that stimulate economic reforms, and push for further rationalisation of oil use in power generation in favor of its monetisation on international markets.

The successful awards to ACWA Power to install 300 Megawatt (MW) photovoltaic (PV) capacity in the Sakaka project, and the joint bid by EDF Renewables and Abu Dhabi Future Energy-Masdar for a wind farm with 400 MW capacity in the Dumat Al Jandal tender by the Renewable Energy Project Development Office of the Ministry of Energy, Industry and Mineral Resources of Saudi Arabia in 2018, achieved prices reaching \$2.34 cent and 2.13 per kilowatt hour (c/kWh) for deliveries to the Saudi Power Procurement Company, establishing a record globally, and for the Europe, Middle East, and Africa region respectively.⁴ With more than 3000 MW of predominantly solar capacity to be installed by 2019 and recently ramped up plans to install 27.3 Gigawatt (GW) over the next five years and 58.7 GW by 2030, these landmark achievements are a “first step on the road to energy diversification and renewable energy leadership” according to H.E. Khalid Al Falih, Minister of Energy, Industry and Mineral Resources of Saudi Arabia.⁵

Against the background of the earlier made advances in the United Arab Emirates and other Gulf countries, these developments highlight the rising confidence in the large-scale deployment of renewables and other energy technologies in oil and gas producing countries. New found impetus for market reforms and improved cooperation among Gulf countries with Europe and the wider world strengthen their viability in the presence of readily available and abundant mineral resources. This includes the deployment of new technologies in enhanced oil recovery and for improving efficiency in the mining, upstream supply, industry and service sectors or the opportunity to free up oil and gas production for petrochemicals and export markets.

³ IRENA (2019), 'Renewable Energy Market Analysis: GCC2019'. IRENA, Abu Dhabi, January.

⁴ REPDO (2019) Overview of Saudi Arabia's Renewable Energy Program, 9 January 2019.

⁵ Tom Kenning ACWA Power wins 300 MW Saudi solar project, 6 February 2018.

The low fuel price hurdle that may only to a certain degree be overcome through the reform of inefficient fossil fuel subsidies meant that the Gulf region is a relative late starter. Yet, wider macroeconomic considerations including the need to leverage international technology advances and innovation in enhancing economic performance, as well as the need to proactively engage in globally shared agendas, will further strengthen the viability and momentum for the use of renewables and other new energy technologies. Also in light of the close interlinkages that exist between power and water production in the Gulf region, renewable and other technologies, including nuclear power, can help reduce hydrocarbon consumption for water purification functions for which demand increases as a function of population growth and urbanisation. The United Arab Emirates and Saudi Arabia have set ambitious plans for the deployment of nuclear power. After a first reactor was expected to come on line in 2017, three more completions are due by 2020 comprising a total capacity of 5.6 GW in the United Arab Emirates. Saudi Arabia has plans to generate power from its own nuclear facilities and could have a “significant” portion of the demand met by 2040.⁶

Other key issues that need to be factored are the still relatively poor interconnections that encourage over reliance on national resources and may inhibit investment and trade required for the effective integration of new energy technologies at scale. Further energy market reforms and improved cooperation among Gulf countries to create an enabling environment for renewables and other new energy technologies, also depends on the role of cohesive tariff mechanisms that will set the pace of further transformations. Work carried out by the Gulf Cooperation Council Interconnection Authority to establish a regional power market has advanced but falls short of reaching trade potentials due to differences in regulated prices and the legacy of self-reliance among resource rich economies.

Member States of the European Union have made considerable advances over the past decades in reshaping vertically integrated markets and national energy policies, towards a single internal energy market that benefits from a growing network of regional interconnections and collective energy security, renewable, efficiency, and greenhouse gas emission targets. Some of the hard lessons learnt in Europe that include the impact of these reforms and visions on relations with key energy producers, will be helpful to Gulf countries to address the risks of suboptimal energy market functioning, through adequate price formation, and investment in infrastructure including mechanisms to reduce volatility and respond to disruptions on energy markets. Dialogue and cooperation can help to strengthen mechanisms to formulate cohesive policies and accelerate the integration of new energy sources for the achievement of visions to the benefit of both regions and global energy markets.

⁶ Wogan, D. et alia 'Energy supply and demand in the GCC' in *The Economics of Renewable Energy in the Gulf*, Akhonbay, H.M. ed., Routledge, 2019.

From Vision to Viability in Europe

The European Commission recently published a strategic long-term vision for a prosperous, modern, competitive and climate neutral economy by 2050.⁷ Under the banner “A Clean Planet for All,” the strategy shows how Europe aims to lead the way to climate neutrality by investing into realistic technological solutions amongst others. To turn vision into reality this would require joint action in seven strategic areas: energy efficiency; deployment of renewables; clean, safe and connected mobility; competitive industry, circular economy; infrastructure interconnections; bio-economy and natural carbon sinks; and carbon capture and storage to address remaining emissions.

The European Commission has gradually come to assert itself as a global champion for countering climate change. Pledging to reduce greenhouse gas emissions by 40% below 1990 levels by 2030, and stepping up efforts to become the first major economy to go climate neutral by 2050 establishes a common direction of travel for member states and through its international engagement the wider world. The vision is ambitious and not without challenges to security of supply and a predictable investment environment to maintain energy market stability at affordable prices among diverging energy matrices. However, these can be turned into opportunities with existing technologies and those close to deployment, as well as through enhanced cooperation on deeper energy market integration among member states. This also includes dialogue with international partners that are required to submit long-term mid-century strategies by 2020 as parties of the Paris Agreement and global efforts to respond to the challenge of climate change. The vision is under consideration and will be discussed at the European Council on 9 May in Sibiu, Romania.

Translation of visions into legislation that includes the adoption of both voluntary and mandatory targets is an important feature of energy policy evolution in the European Union. Three important legislative documents entered in to effect on 24 December 2018.⁸ These include:

- The revised renewable energy⁹ directive that establishes an EU wide binding target for renewable energy deployment of at least 32% for 2030 and includes a review to increase this by 2023,
- The revised energy efficiency directive that sets a non-binding target of 32.5% in efficiency gains by 2030 also with a review for upwards revisions by 2023,
- A new governance regulation that, among others, requires member states to develop integrated national energy and climate plans for 2021 to 2030 to achieve these targets.

⁷ European Commission – Press Release, The Commission calls for a climate neutral Europe by 2050, Brussels, 28 November 2018.

⁸ Official Journal of the European Union, L328, Volume 61, 21 December 2018.

⁹ The EU defines renewable energy as energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas.

Beyond renewables and energy efficiency, European Union member states are sharpening focus on the on the role of new energy technologies and enhancing synergies among renewables and hydrocarbon technologies and industries, including the water-energy and food nexus to improve the long-term sustainability of existing consumption patterns.

Germany closed eight of its seventeen nuclear reactors that it pledged to phase out by the end of 2022 after the Fukushima nuclear disaster in 2011. Recommendations made by the German coal council on 26 January that the government is likely to implement pledge to phase out coal by 2038 and highlight the gradual nature of energy transitions. Despite substantial reductions over the past decade in both Germany and the United Kingdom that have reduced coal capacity from 59 GW to 41GW and 32GW to 15GW respectively between 2010 and 2018, new energy technologies such as carbon capture and storage as well as higher thermal efficiencies will be needed to enter on more sustainable pathways.

Here the role of increasingly abundant natural gas resources and related technologies that reinforce the integration of renewable energy technologies are hard to understate. Rising import dependencies, and other European legacies mean that the potential of natural gas is likely to remain subdued adversely affecting the industries long-term license to operate without improved government industry cooperation and dialogue. The 6th IEF-IGU Ministerial Gas Forum was held under the theme “Inclusive Growth Towards a Sustainable Energy Future: The role of gas technologies and innovation” on 22 November in Barcelona Spain and aimed to develop a clear vision on what is needed to roll-out new technologies and step-up innovation that delivers inclusive growth and healthy and sustainable energy futures. Delegates concluded that dialogue and cooperation stands at the centre of the growing interface between maintaining global energy security, implementing nationally determined contributions to avoid catastrophic climate change and accelerate sustainable and inclusive growth and development.

Opportunities that new gas technologies offer have the potential to bolster energy security and achieve climate change and sustainable development goals. Delegates took note of various industry and government actions that engage the gas sector, including:

- The “IEF Energy Efficiency Knowledge Sharing Framework” proposed at 6th IEF Asian Energy Ministerial Roundtable in November 2015 and launched at the 15th IEF Ministerial Energy Forum in September 2016 with the support of the G20 Energy Ministers gathered under the G20 Presidency of China in 2016, that focuses on making energy supply chains more efficient and sustainable.
- The “Hydrogen Initiative” EU governments signed under the Austrian EU Presidency on 18 September 2018 that aims to maximise the options of sustainable hydrogen technology for

the decarbonisation of multiple sectors including through the use of gas infrastructure, that enables the accelerated deployment of renewables and viable options for Carbon Capture and Storage.

- The “Oil and Gas Climate Initiative” that on 25 September 2018 set the target to reduce by 2025 the collective average methane intensity of its shared upstream gas and oil operations by one third.

Greater dialogue and cooperation between Europe and the Gulf will ensure that progress can be made in separate areas simultaneously so that technologies are deployed more rapidly in a mutually reinforcing and cost-effective manner in both regions. This will strengthen producer-consumer relations and stimulate timely investment in oil and gas supply-demand balances while advancing new energy technologies.

Key Questions

1. How can the deployment of new energy technologies and the EU’s long-term vision on carbon neutrality by 2050 strengthen producer consumer relations?
2. What may Gulf countries learn from the European experience in the deployment of new energy technologies to foster inclusive economic growth and strengthen energy security?
3. Where will enhanced dialogue and cooperation between Europe and the Gulf have the greatest impact on successfully unlocking investment and facilitating the transfer of skills and new energy technologies?
4. How can regional cooperation be strengthened to mobilise private sector investment and build scale for more efficient energy system management?
5. In which new energy technology domains do Europe and Gulf countries share complementary advantages that can stimulate trade and investment, and accelerate sustainable energy market transformations?
6. What are the comparative advantages in the European and GCC workforces; and how can they be leveraged?
7. How is public acceptance of the implications of energy sector transformations addressed in Europe and the Gulf?
8. What mechanisms work best to stimulate low carbon technologies growth in the Gulf; which European approaches may apply?

Backgrounds

The 1st inaugural IEF-EU Energy Day held on 14 February 2017 focused on clean energy and energy efficiency trends in Saudi Arabia and the Gulf region. At the 2nd IEF-EU Energy Day, EU representatives debated efficient and sustainable resource management in the circular economy with Gulf country representatives highlighting the benefits of greater energy efficiency and waste management for secure and sustainable functioning of energy markets.

Sharing of knowledge and experiences between government and industry representatives on the open and neutral platform that the IEF provides will help to strengthen cooperation and advance investment and trade opportunities between Europe and the Gulf region and producer and consumer countries globally. Outcomes will help to inform the global energy dialogue including the 8th Asian Ministerial Energy Roundtable hosted by the United Arab Emirates on 9-10 September 2019 in Abu Dhabi with India as co-host, and the 17th International Energy Forum Ministerial hosted by China and co-hosted by Morocco in 2020.



INTERNATIONAL ENERGY FORUM

INTERNATIONAL ENERGY FORUM
PO BOX 94736 RIYADH, 11614
KINGDOM OF SAUDI ARABIA
TEL: +966 11 481 0022
FAX: +966 11 481 0055
WWW.IEF.ORG

