

**EDA INSIGHT**



# The UAE/Saudi Arabia–East Asia Energy Relations: Towards More Dynamic and Diverse

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## **Executive Summary**

- The UAE/Saudi Arabia–East Asia energy relations are becoming more dynamic and diverse. As a result, identifying the overarching trend in their development is no longer an easy task. These relations are underpinned by two global energy-related trends: the oil glut and the shift to non-hydrocarbon energy.
- The growing East Asian economies provide the UAE and Saudi Arabia with opportunities in terms of markets to export their oil and sources of investment in their oil industry.
- Nevertheless, given that it is in the interest of East Asian countries to diversify the sources of their oil imports, and that it is easier for them to do so in today's global oil glut environment, it will be sensible for the UAE and Saudi Arabia not to only rely on the Chinese market, but also keep pursuing a diversification of their oil-export markets to South and Southeast Asian countries such as India and Indonesia.
- The rise of East Asian nuclear-reactor exporters gives the UAE and Saudi Arabia greater options in choosing their partners for their nuclear power development programmes going forward. Both Seoul and Beijing politically back the export of nuclear reactors as part of their new growth strategies.
- However, it is desirable for the UAE and Saudi Arabia to carry out strict feasibility assessments before making an agreement – not only with emerging reactor-exporters but also with established ones – if they decide to include or expand nuclear power as component of their future power supply plans.
- East Asian firms' growing interest in the solar markets in the UAE and Saudi Arabia also provides the latter with greater options in selecting partners in this field. The challenge is the high competitiveness of Chinese solar exports, with which local producers will need to compete, especially in the case of Saudi Arabia.
- The possibility of 'spill-over' from the greater energy relations between the UAE/Saudi Arabia and East Asian countries to their stronger political relations remains questionable, given that East Asian governments tend to more strictly discern political affairs from economic ones than their Western peers. Currently, the only driver that would potentially make East Asian states politically committed to the affairs in the Gulf region in a substantive manner will be a significant decline of the US influence in this region.

## The Issue

This Insight explores the changing patterns of energy relations between the UAE/Saudi Arabia and East Asian countries. The UAE and Saudi Arabia are the two largest oil-producing countries among the six Gulf Cooperation Council (GCC) countries, producing around three million barrels per day (bpd) and around 10 million bpd, respectively. They are the two largest suppliers of crude oil to Japan, and Saudi Arabia had been the largest supplier of crude oil to China until it was replaced by Russia in 2016. They are also the only states in the GCC that are currently implementing nuclear energy programmes, and the leading GCC countries in the deployment of renewable energy.

As the UAE/Saudi Arabia–East Asia energy relations are becoming more dynamic and diverse, identifying the overarching trend in their development is no longer an easy task. Two broad currents in the global energy industry, however, appear to underpin the development of these relations. On the one hand, the global oil glut, which began in the latter half of 2014, is now entering its fourth year. The price of West Texas Intermediate, a brand of crude benchmarking the price of oil globally, has been above US\$50 for most of this year so far: although it is slightly up from the 2016 average of US\$43, it is still at around half of the 2013 average (US\$98). The abundance of oil in the market is affecting the energy strategies of both the UAE/Saudi Arabia and East Asian countries, as both sides are heavily dependent on this energy source for the security of their national economies.

On the other hand, it seems that the low price of oil has not halted the world's shift to non-hydrocarbon energy. The phenomenon sometimes referred to as the 'nuclear renaissance' continues among emerging economies, and renewable energy is rapidly making inroads into the global energy industry. The IEA estimates that around a fifth of the electricity used across the world will be generated through these energy sources by 2020.<sup>1</sup> The UAE/Saudi Arabia–East Asia energy relations are obviously not free from this global transition.

## Relevance for the UAE and Saudi Arabia

- In the oil sector, the large and growing East Asian economies provide the UAE and Saudi Arabia with opportunities in terms of markets and as sources of investment.
- Natural gas is *relatively* insignificant to the UAE/Saudi Arabia–East Asia energy relations.

- In terms of nuclear energy, the long-term outlook remains uncertain with regard to expansions beyond current projects, determined by the future export capacity of East Asian countries.
- East Asian firms' growing interest in the solar markets in the UAE and Saudi Arabia provide these two GCC countries greater options in selecting their partners in this field.

## Hydrocarbons: Diversification at Work

**Oil**, which is a breadwinner of the economies of the UAE and Saudi Arabia, is a key plank of the UAE/Saudi Arabia–East Asia energy relations. The continuing rise of China as a global industrial hub upholds the growing reliance of the UAE and Saudi Arabia on this East Asian country as a market to sell their oil to. Nevertheless, it is, indeed, hard to identify a single trend in the recent development of UAE/Saudi Arabia–China oil relations, and the recent developments appear to be rather counterintuitive.

Given China's economic growth, some may expect that the share of China in the total oil exports of both these GCC countries has been on the rapid rise. Certainly, this is the case for the UAE. Between 2013 and 2015, China's share in the UAE's total crude exports rose by 5.6 percent units (from 9.5% to 15.1%), according to the UN Comtrade Database.<sup>2</sup> However, this is not the case for Saudi Arabia. China's share in Saudi Arabia's total crude exports rose by only 1.6 percent units over the same two-year period (from 14.4% to 16.0%). Furthermore, the jump in the case of the UAE owed partly to the low initial base: China's share in the UAE's total crude exports in 2015 was still much smaller than that of its other major Asian export partner, Japan, which accounted for 51.8% of UAE exports in 2015.

Similarly, the level of China's dependence on oil supplied by the UAE and Saudi Arabia has not seen a rapid rise, as might have been expected. The proportion of crude from the UAE in China's total crude imports remained unchanged, at 3.8% between 2013 and 2015. It is even declining in the case of Saudi Arabia: the proportion of crude from Saudi Arabia in China's total crude imports declined by 3.8 percent units, from 19.2% in 2013 to 15.4% in 2015. This is attributable to the global oil glut, which has given China greater opportunities to diversify the sources of its oil imports. In fact, China's imports of Russian oil have been on a steady rise. The proportion of Russian oil in China's total crude imports increased by 3.9 percent units between 2013 and 2015 (from 8.9% to

12.8%). In 2016, for the first time, Russia reportedly overtook Saudi Arabia as the largest supplier of crude to China – even if only by a small margin of 30,000 bpd.<sup>3</sup>

Furthermore, perhaps contrary to intuition, China has *not* begun grabbing oil concessions in Saudi Arabia whose upstream is monopolised by Saudi Aramco and has not been open to foreign investors – although Saudi Aramco is now in preparation for its initial public offering (IPO), and China and Japan are in the middle of formulating their strategies to gain stakes in it.

This is, however, the case for the UAE: in particular, a recent re-tender of Abu Dhabi Company for Onshore Petroleum Operation (ADCO), an onshore venture of Abu Dhabi National Oil Company (ADNOC) that is responsible for nearly half of oil production in Abu Dhabi. This event indicated the UAE's clear intention to strike a balance between the West and the East in its relations with external actors in the field of oil. In February 2017, a 12% stake in the company was awarded to two Chinese companies: 8% to China's state-owned China National Petroleum Corporation (CNPC); and 4% to CEFC China Energy, a Shanghai-based private firm.<sup>4</sup> Prior to this, 5% and 3% of the company were also allotted to Japan's INPEX and South Korea's GS Energy, respectively, in 2015. Now the shares of the companies from three East Asian countries combined are 20% – half of the total shares offered – while 40% of the shares were previously owned by Western firms (before 2014).

**Natural gas**, in comparison to oil, is not a major energy commodity traded between the UAE/Saudi Arabia and East Asian countries – unlike Qatar, which is a major supplier of liquefied natural gas (LNG) to Japan and South Korea. It is unlikely, at least in the immediate future, that either the UAE or Saudi Arabia will become major suppliers of LNG to East Asia because of their need to prioritise domestic consumption of natural gas over exports in light of the rising domestic power demand.

The UAE is home to the world's seventh largest proven natural gas reserves (6,091 billion cubic metres, bcm, in 2014). Nevertheless, it is a net gas-importing country because of its high domestic consumption, largely for power generation and water desalination. In addition, most natural gas in the UAE contains high levels of sulphur and is thus costly to process.<sup>5</sup> The UAE exports a small amount of LNG, the vast majority of which is destined for Japan. The UAE, however, only accounts for a small share in Japan's total LNG imports – 6% in 2016 – dwarfed by those of Australia (27%), Malaysia (18%), and Qatar (15%).<sup>6</sup> On the other hand, Saudi Arabia is home to the world's sixth largest

proven natural gas reserves (8,488 bcm in 2014), but it does not export natural gas either due to the domestic demand.<sup>7</sup>

**Opportunities and Challenges for the UAE/Saudi Arabia–East Asia Relations:** The large and growing East Asian economies certainly provide the UAE and Saudi Arabia with opportunities in terms of markets to export their oil, and sources of investment in their oil industry. Nevertheless, as China's recent policy indicates, it is in the interest of East Asian countries to diversify the sources of their oil imports, which is easier in today's global oil glut environment. Thus, it will be sensible for the UAE and Saudi Arabia not to only rely on the Chinese market, but also keep pursuing a diversification of their oil-export markets, as well as sources of investment. In this sense, the strategic values of South and Southeast Asian countries, such as India and Indonesia, seem to increase in the coming years.

## Nuclear Energy: Uncertain Future Outlook

While the world has been witnessing a nuclear renaissance – a new boom in construction of nuclear reactors led by emerging economies – the UAE and Saudi Arabia have been the leading GCC countries in this field. While Saudi Arabia is currently conducting feasibility studies to build nuclear reactors sometime after 2020, the UAE is already implementing the project with a goal to have four nuclear reactors operational by 2020.

**The UAE** has been developing its nuclear power programme since 2008, in response to the growing domestic power demand. In December 2009, the UAE signed an agreement with South Korea for the construction of its first four nuclear reactors. According to the agreement, these four nuclear reactors, all with the third-generation APR-1400 design, will be built by Korea Electric Power Corporation (KEPCO), South Korea's semi-governmental utility, in Barakah in Abu Dhabi by 2020. Each reactor will have a power generation capacity of 1.4GW; in total, the plant will generate 5.6GW, which equates to nearly a fifth of the current electricity supply capacity in the UAE.<sup>8</sup>

The major reason why KEPCO was selected as a partner appears to have been its offer of generous conditions such as the price estimated to be 40% cheaper than its competitors and the 60-year operating guarantee.<sup>9</sup> KEPCO was able to offer this deal, which even makes the profitability of the project for the company questionable, because of the strong political backing by the South Korean government.

To achieve this plan, the launch of the first reactor, Barakah-1, was scheduled for May 2017. Nawah Energy, a subsidiary of the UAE's state-owned Emirates Nuclear Energy Corporation (ENEC) – 18% of which is owned by KEPCO, has been established as the company responsible for the operation of the reactors.<sup>10</sup> At the time of writing, the launch is planned for 2018 as Nawah did not receive an operating license from the country's regulatory authority by May 2017.<sup>11</sup> Although the initial construction activities of the Barakah-1 reactor had already been completed, the reactor remains in need of passing strict assessments by experts from local and international bodies as well as reinforcement of operational proficiency for plant personnel.<sup>12</sup> Press sources have suggested that the project timeline has also been conditioned by the delayed commercial launch of KEPCO's prototype reactor in South Korea from 2013 to 2016.<sup>13</sup> (A country which newly starts exporting third-generation reactors with its locally-developed design needs to commercially launch a reactor with the same design at home – a so-called 'prototype reactor' – prior to the launch of exported reactors in order to prove the reactor's safety.)

The question of how soon the Barakah-1 reactor will see its commercial launch may determine the future trajectory of Gulf–East Asia nuclear energy relations, as possible further delays could affect perceptions regarding the credibility of South Korea as a reactor-exporting country (even if delays may happen with the existing reactor-exporters, like the case of the French-built Olkiluoto-3 reactor in Finland). It could also influence perceptions about other newcomers in the reactor-exporting industry, such as China, which, under its One Belt One Road initiative, has drafted an ambitious plan to export 30 nuclear reactors by 2030.<sup>14</sup>

**Saudi Arabia** has also been targeted by Seoul as a potential market for the export of nuclear reactors. Following the June 2011 announcement by the Saudi government that it would construct 16 nuclear reactors by 2030,<sup>15</sup> South Korea signed a memorandum of understanding (MoU) with Saudi Arabia on nuclear cooperation, in November 2011.<sup>16</sup> Later, in March 2015, an agreement to carry out a feasibility study to build reactors in Saudi Arabia was signed between the King Abdullah City for Atomic and Renewable Energy (KACARE) and the Korea Atomic Energy Research Institute (KAERI).

The KACARE – now focusing on research and development, leaving policy-making to the Ministry of Energy, Industry, and Mineral Resources created in May 2016 – and the KAERI will cooperate on a small-sized 330MW fourth-generation nuclear reactor

called SMART (System-integrated Modular Advanced Reactor), a design developed by the latter. The two parties have agreed on the transfer of technology for the localisation of the reactor in Saudi Arabia and its joint promotion globally.<sup>17</sup> The timeframe of this project, nevertheless, remains unclear, with KAERI so far not having constructed a demonstration unit at home. Saudi Arabia's National Transformation Program (NTP) 2020, an interim programme of Saudi Vision 2030, also only addresses the task for the KACARE to '[i]dentify and prepare the construction locations of the first nuclear power plant sites and provide necessary infrastructure'.<sup>18</sup>

China, which aims to be enter the reactor-exporting industry, has also been wooing Saudi Arabia in this field. In March 2017, upon King Salman bin Abdulaziz Al Saud's visit to Beijing, the KACARE signed an agreement with the China Nuclear Energy Engineering Group (CNEC) to study the feasibility of constructing high-temperature gas-cooled reactors (HTGR), another fourth-generation model, in Saudi Arabia. A demonstration unit of this design has been under construction in Shidaowan in China since 2012 with the goal to launch its commercial operation in late 2017.<sup>19</sup> Saudi Arabia and France have also signed an agreement to conduct a feasibility study for the construction of two reactors.<sup>20</sup>

**Opportunities and Challenges for the UAE/Saudi Arabia–East Asia Relations:** The rise of East Asian nuclear-reactor exporters gives the UAE and Saudi Arabia greater options in choosing their partners for their nuclear power development programmes going forward. Both Seoul and Beijing politically back the export of nuclear reactors as part of their new growth strategies. It is, however, desirable for the UAE and Saudi Arabia to carry out strict feasibility assessments before making an agreement – not only with emerging reactor-exporters but also with established ones – if they decide to include or expand nuclear power as component of their future power supply plans.

## Renewable Energy: Emerging Cooperation

In recent years, renewable energy, especially solar energy, has grown to become a non-negligible field of the UAE/Saudi Arabia–East Asia energy relations. This is in line with the global trend, namely that solar energy is rapidly making inroads into the global power industry owing to declining technology costs, which are in part driven by the growth of low-cost production of solar modules in China, a country that hosts around three quarters of the global photovoltaic (PV) production capacity today.<sup>21</sup>

The UAE is already implementing large-scale solar projects while Saudi Arabia just had a fresh start under the new renewable energy initiative of the current leadership. While Western, particularly Spanish, firms have been more active than East Asian ones in the solar market in the UAE in the past, East Asian firms are now more proactively seeking opportunities both in the UAE and Saudi Arabia. Chinese firms aim to export their solar modules to the emerging solar markets in the two GCC countries while Japanese firms, leveraging their technology, are looking for investment opportunities.

**The UAE** has been leading in the deployment of solar energy among the GCC countries. Following Masdar's 100MW Shams-1 concentrated solar power (CSP) plant, which came on stream in March 2013,<sup>22</sup> Dubai's Mohammed bin Rashid Al Maktoum Solar Park is currently implementing a 1 GW PV project, and has set a goal of achieving a 5 GW capacity by 2030.<sup>23</sup> The existing projects deploy technology contributed by firms from Western countries, mainly Spain. The leading role of Spanish firms is due to their proactive exploration of markets outside Spain, especially after the slowdown in the growth of the country's domestic solar market following the financial crisis in 2008.<sup>24</sup> The size of the solar projects currently implemented by Spanish firms in Dubai have attracted East Asian firms' attention to the UAE market.

So far, however, East Asian firms have been less active in this market, partly due to their booming domestic solar markets, which have continued their growth owing to governmental support. However, as competition in their domestic markets has become more intense, more East Asian firms have begun casting their eyes on foreign markets. A breakthrough was made in March 2017 when Abu Dhabi's 1.2 GW PV project in Sweihan was awarded to a consortium of Japan's Marubeni and China's Jinko. The East Asian consortium broke a global price record for solar power projects with its contract of supplying electricity at US¢2.42 per kWh.<sup>25</sup> This should be seen as a positive development because engagements between the UAE and East Asian countries in the past years in this field had not previously yielded tangible outcomes.

**Saudi Arabia**, with its Vision 2030 and the NTP 2020, targets the generation of power through renewable energy at a total capacity of 3.45 GW by 2020 and 9.5 GW by 2023.<sup>26</sup> The country's solar programme had been delayed for years due to reported disagreements within the government over the leadership in this field.<sup>27</sup> The government restructuring in May 2016 unified all administrative functions necessary for carrying out renewable energy projects under the newly-created Ministry of Energy, Industry, and Mineral Resources.<sup>28</sup>

Under the Ministry of Energy, Industry, and Mineral Resources and its Renewable Energy Project Development Office (REPDO), Saudi Arabia's renewable energy programme received a fresh start. In February 2017, the REPDO announced the National Renewable Energy Program (NREP).<sup>29</sup> The NREP's 'Round One' will begin with a 300 MW PV project in the city of Sakaka in the northern region of Al-Jawf. In April, four pre-qualified bidders for this project were announced, which included Japan's Marubeni and Mitsui, along with France's EDF and Saudi Arabia's ACWA Power.<sup>30</sup> Marubeni and Mitsui were also shortlisted for a 400MW wind project, also part of the NREP Round One.

However, Japan's involvement in Saudi Arabia's solar sector dates back further. Japan's Solar Frontier has been working in the Kingdom on small-scale pilot projects since shortly after the creation of the KACARE in 2010. Solar Frontier is a subsidiary of Showa Shell, a Japanese refinery, 15% of which has been owned by Saudi Aramco since 2004.<sup>31</sup> In 2011, the company helped the launch of a small-scale (500kW) solar power plant on Farasan Island in the Red Sea.<sup>32</sup> It also provided its solar modules to Saudi Aramco's 10.5 MW solar carpark project in Dhahran in 2012.<sup>33</sup>

In fact, Saudi Arabia's ambition in this field goes beyond the mere generation of electricity. It aspires to become a hub for the production of solar modules. While the UAE's Masdar abandoned its plan to locally manufacture solar modules already in 2011 due to the predicted low profitability of the plan in the age of China's domination in global PV production,<sup>34</sup> Saudi policymakers believe that it will be doable in the Kingdom because of the potentially large size of its domestic demand for solar power. The government also sees a role for the solar manufacturing industry in helping the country in creating jobs for the local workforce and making a transition to a post-oil economy.<sup>35</sup>

However, competing against Chinese imports remains a key challenge for Saudi solar products. To support local production, the NTP 2020 sets a target of 35% local content contribution in the renewable energy sector.<sup>36</sup> Under this regulation, local Saudi firms may form an alliance with foreign firms with proven technology that are also exposed to harsh competition with Chinese producers in the global market, like Japanese ones. Saudi Aramco, designated by Saudi Vision 2030 to be transformed into an 'industrial conglomerate',<sup>37</sup> is likely to be a central player in this field. In January 2017, the company disclosed its idea of investing US\$5 billion in renewable energy companies across the world, in order to acquire technology and know-how in this field.<sup>38</sup>

## **Opportunities and Challenges for UAE/Saudi–East**

**Asia Relations:** East Asian firms' growing interest in the solar markets in the UAE and Saudi Arabia provide them with greater options in selecting partners in this field. The challenge is the high competitiveness of Chinese solar exports, with which local producers need to compete, especially in the case of Saudi Arabia.

## **Conclusions**

The energy relations between the UAE and Saudi Arabia and East Asian countries are increasingly dynamic and diverse. In the oil sector, the large and growing East Asian economies provide the UAE and Saudi Arabia with opportunities in terms of markets and sources of investment. Nevertheless, it is in the interest of East Asian economies to diversify the sources of their oil imports, which is easier in today's global oil glut environment. In comparison, the natural gas sector is relatively insignificant to the UAE/Saudi Arabia–East Asia energy relations.

In the nuclear sector, the rise of East Asian nuclear-reactor exporters gives the UAE and Saudi Arabia greater options in selecting their partners for their early nuclear power development programmes. It is, however, desirable for the UAE and Saudi Arabia to carry out strict feasibility assessment before any further agreements – not only with emerging reactor-exporters but also with established ones. In the solar sector, East Asian firms' growing interest in the solar markets in the UAE and Saudi Arabia also gives these two countries greater options in selecting partners. The challenge is the high competitiveness of Chinese solar exports, with which local producers need to compete, especially in the case of Saudi Arabia.

There remains a question as to whether the greater energy relations between the UAE/Saudi Arabia and East Asian countries could 'spill over' to their stronger political relations. However, the possibility of such spill-over is questionable, given that East Asian governments tend to more strictly discern political affairs from economic ones than their Western peers. Although these governments tend to use the adjective 'strategic' in referring to their bilateral relations with these two GCC countries, whether this adjective is translated into substantial actions is another issue. Currently, the only driver that would make East Asian states politically committed to the affairs in the Gulf region in a substantive manner will be a significant decline of the US influence in this region – a trend which still is not clear enough yet for drawing further conclusions.

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