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The giant Kashagan oilfield, Kazakhstan. Cover story by Robin Mills.

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Qamar Energy, headquartered in Dubai, is the leading regionally-based energy consultancy on the Middle East and North Africa (MENA).

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QAMAR ENERGY قمر

NAZARBAYEV STILL HOLD LEVERS OF POWER IN THE ENERGY-RICH KAZAKHSTAN

Robin Mills • *A version of this article appeared in The National, Mar. 27, '19* • **COVER STORY**

Nursultan Nazarbayev, president of Kazakhstan since independence, has stepped not down, but up. The 78-year old leader resigned last Tuesday, but continues to hold many of the levers of power. His successor needs to find both balance and reinvention in this oil-producing crossroads between Russia, the Caspian Sea and China.

In 1991, Mr Nazarbayev, head of the Kazakh Communist party, led to independence a landlocked country, the size of western Europe, with no history of self-government and a sparse population which was 37 per cent ethnic Russians. Centrally-planned agriculture had dried up the Aral Sea in the south-west, and the Semipalatinsk area in the east was contaminated by hundreds of nuclear bomb tests. The republic produced about half a million barrels of oil per day, the second largest in the USSR after Russia, but this dropped off sharply in the early years after the break-up.

From that unpromising beginning, the new government opened up to foreign petroleum investment. Mr Nazarbayev turned down Boris Yeltsin's proposal that he give the large Tengiz oil-field to Russia. Instead, it and Karachaganak gas field, Soviet discoveries, were developed by international consortiums. China National Petroleum Corporation also established a strong presence.

In 2000, a who's who of the global energy industry found the Kashagan field, with 13 billion barrels of reserves, the largest conventional find anywhere for three decades. Under the shallow waters of the north Caspian, freezing at -40° Celsius in winter and sweltering in 40 degrees in summer, the reservoir is beneath 4,200 metres of rock and a thick layer of shifting salt. The oil is at extreme pressure and highly sour – with toxic, corrosive hydrogen sulphide. With neither ExxonMobil nor Shell wanting the other to be operator, a compromise candidate, Eni, was appointed, but the Italians struggled with the technical challenges. After spending about $50 billion, production finally began in September 2013 but had to stop as the corrosive gas caused a pipeline leak, costing $3bn to fix. Finally regular output commenced in 2016 and ramped up to 370,000 barrels per day, while it could eventually reach 900,000 bpd with more heavy investment.

This caused national production, on a plateau around 1.6 million bpd since 2010, to jump to 1.81 million bpd last year, almost as much per person as Iraq. The country's production should gradually expand over the next few years, but major gains will require cracking the code of Kashagan's geology, sustaining mature fields, exploiting shale oil and gas, and revitalising exploration in the Caspian and the vast steppes. 2017's plan for super-deep drilling around the Caspian in the "Eurasia Project", targeting more than 400 billion barrels of oil, brought in Shell last year, but little has been heard since.

After declining throughout the 1990s, the economy grew almost 7 per cent annually since 1999 on rising oil output and prices. With minimal population growth, per-capita incomes boomed and the country was transformed beyond recognition. Even after 2014's fall in oil prices, the deficit is moderate and growth a respectable 3.8 per cent last year.

Kazakhstan may not be the world's largest exporter of potassium, but it is the second-biggest oil and coal producer in the former Soviet space, and by a long way the globe's biggest miner of uranium. It joined the OPEC+ pact in 2016, likely under friendly persuasion from Vladimir Putin, but with Kashagan starting up, it has not even pretended to comply with production cuts.

The oil pipeline from the Caspian to China is a vital lifeline that does not depend on easily-interdicted marine routes. Another line runs the other way, to Russia's Black Sea port of Novorossiysk. Kazakhstan is not nearly as rich in gas, but the key West-East pipeline from Turkmenistan and Uzbekistan to China crosses it.

The country's geography makes it key to China's "Belt and Road Initiative", and Mr Nazarbayev has stayed close to both Xi Jinping and Mr Putin, while remaining friendly with Washington. This is essential, as Kazakhs may fear Russian encroachment in the style of Ukraine and Georgia, and China's internment camps for their brethren in neighbouring Xinjiang.

Mr Nazarbayev's regime is authoritarian, but did not descend into the more bizarre personality cult of Turkmenbashi in Turkmenistan, the brutal repression in Uzbekistan under Islam Karimov, or the early 1990s civil war in Tajikistan. With Mr Karimov's death in September 2016, Mr Nazarbayev became the last of central Asia's Soviet-era leaders.

His successor is the topic of Kremlinologists' intense speculation. It could be Kassym-Jomart Tokayev, a political supporter who has been named acting president; Mr Nazarbayev's daughter and senate chairperson Dariga Nazarbayeva; his nephew and security agent Kairat Satybaldy; his son-in-law and former sovereign wealth fund chief Timur Kulibayev; or a surprise candidate.

Whoever follows will have the former president in his elevated role as a guide and string-puller. The new president will have to continue the tricky balancing act between Beijing and Moscow. The stagnating giant to the north faces an ultimate transition from Mr Putin; the eastern colossus is slowing economically but expanding its reach into central Asia. More populous, restive, agrarian Uzbekistan to the south is slowly opening up under its new president.

Foreign policy cannot neglect Kazakh citizens' aspirations. Complaints over living standards and human rights led to protests in the oil town of Zhanaozen in 2011, where security forces killed several protestors and Mr Kulibayev was blamed and fired. There were further protests in 2014 and 2016.

Despite a reasonable situation today, the typical economic problems of petrostates remain: falling productivity, corruption, a heavy state hand, and unsophisticated output. If oil prices remain stagnant, and production expands only a little, growth has to come from elsewhere. The canniest post-Soviet leader leaves a mixed 30-year legacy to his successor.

WHY OPEC MAY BE GETTING SQUEEZED IN THE OIL PRICE WAR

Robin Mills • *A version of this article appeared in The National, Mar. 17, '19*

The deal between OPEC and some non-OPEC states has been an impressive achievement. As the monitoring committee meets in Baku on Monday, they will find that compliance to production cuts has been high, excess stockpiles have fallen to normal levels and prices have recovered from a low of $28 per barrel in January 2016 to above $80 per barrel in November. But does the deal's very success undermine it?

When the oil price began to drop in late 2014, guided by then Saudi oil minister Ali Al Nuaimi, OPEC judged that it was time to fight a price war. Saudi Arabia jacked up production and intensified the slump, with the aim of diverting investment away from shale and other non-OPEC basins. He had in mind the disastrous early 1980s, when the kingdom's attempts to shore up prices by cutting production without support from others led its exports to fall dramatically.

In 2016, the kingdom changed tack, Mr Al Nuaimi was replaced by Khalid Al Falih, and an alliance was forged with Russia, which in turn encouraged Iran and a group of non-OPEC states, including Oman and others, to co-ordinate production cuts. This assuaged Saudi concerns that they would bear too much of the burden and lose market share to producers outside OPEC. The road proved to be longer and harder than the OPEC+ alliance had anticipated. However, by late last year inventories had been reduced to typical levels and prices had rebounded.

Nonetheless, other factors ran in the coalition's favour too. The world economy, after some weakness in 2016, was stronger during 2017-18, and the after-effect of low prices boosted oil demand. After the Iran nuclear deal brought its production back during 2016, US President Donald Trump's decision to reimpose sanctions took much of its oil off the market again starting in mid-2018. Venezuela's output has been in free fall and in the next few months is only going to get worse.

Libya's volatile production is, in its best months, bumping up against usable capacity. Nigeria is up with a new deepwater field but violence remains a threat in the Niger Delta. Algerian output has not been affected by the country's widespread protests, but remains moribund. Iraq, which has given a fig leaf of adherence to the production cuts, and Kazakhstan, are the only significant producers who have chosen to challenge their assigned limits. And Alberta in non-OPEC Canada has helped by volunteering an unexpected curb on its output.

In 2016, OPEC's market share of world petroleum was 38.7 per cent. If it sticks with the deal through this year, production remains at February's levels, and Saudi Arabia and others make up for any further losses from Iran and Venezuela, that share will be down to 35.1 per cent by the fourth quarter. Meanwhile, Russia, another main beneficiary of the deal, has given up hardly any market share, while higher prices have supercharged shale drillers. That is the cost of boosting prices to current levels of around $67 per barrel, still considered barely adequate by many leading producers.

Of course, prices will be volatile and may spike at times because of upsets to production elsewhere. But Saudi Arabia and its allies will be encouraged to use their spare capacity to tame such spikes, particularly given the "NOPEC" bill making its way through US congress, threatening anti-trust litigation against the producers' organisation.

The International Energy Agency's latest forecast to 2024 expects growth in US shale to gradually level, but other non-OPEC suppliers, notably Brazil and new entrant Guyana to step up. They project demand growth to gradually slide, even without factoring in a likely worldwide economic slowdown at some point.

Beyond 2024, the IEA's outlook might appear more sanguine, as American shale growth is expected to slow and eventually reverse. Even assuming that happens, though, and shale oil development does not spread to other countries, oil demand will by then be facing increasing headwinds from electric vehicles and tougher action against climate change.

Overall demand for OPEC crude is set to not increase at all to 2024, and perhaps not much beyond that. Its members will get some limited relief as an excess of light shale crude boosts relative prices for their typically medium and heavy grades. A likely jump in oil prices at the end of this year as new marine fuel regulations come in will be offset by lower demand.

Economic relief will be relative, favouring the stronger countries in the group, not exporters as a whole.

Within the overall cap, Iraq and the UAE should be able to increase production, taking market share from their less fortunate peers. Saudi Arabia, of course, could increase output but will not do so if it remains committed to market management. And Venezuela represents only downside for oil prices, since a new government would be able to engineer at least some recovery in its petroleum sector, with arguably legitimate president Juan Guaido promising openness to private investment. Beyond successful market management, the producers' organisation needs a vision, either an exit from, or a commitment to, indefinite restraint. OPEC does not have an infinite runway.

CHANGE IN ALGERIA MAY SPUR OVERDUE OVERHAUL OF ECONOMY

Robin Mills • *A version of this article appeared in The National, Mar. 10, '19*

Huge peaceful protests again enveloped Algeria on Friday, opposing a fifth term for the ageing and ill president Abdelaziz Bouteflika. The system has managed to keep a rigid economy afloat through its hydrocarbon earnings. But, while the country's oil and gas sector is old it is, unlike the president, also on life support. The regime may be able to defuse the current protests by letting go of Mr Bouteflika, if they can agree on an alternative candidate. Under its current model, though, Algeria's problems will remain. The failings are twofold: a petroleum sector in gradual decline; and a failure to turn its earnings into a diversified economy and new export industries.

The country, an OPEC member, reached almost 2 million barrels per day of oil output in 2005, but this has since drifted down to about 1.5 million bpd. Some smaller new fields will give a brief bounce in the early 2020s, but then decline will resume without significant new finds. And, of course, the fall in oil prices since 2014, even with some recovery subsequently, has slashed revenues.

Algeria remains the largest gas producer in Africa, and a key supplier to Europe via pipelines to Italy and Spain, as well as liquefied natural gas (LNG). It is important for replacing declining indigenous European gas output and preventing over-dependence on Russia.

But although output of marketed gas surged in 2016, overall it has been on an undulating plateau since 1999. A large part of the gain was achieved by reducing injection of gas into the ageing Hassi Messoud oilfield, in line with OPEC cutbacks but compromising future output. The giant Hassi R'mel gas field is dwindling, the cupboard of new developments is mostly bare, while exploitation of the country's enormous shale gas resources has been held up by local protests and unattractive investment conditions.

Meanwhile, domestic demand is steadily rising. In a pattern common throughout the Mena region, subsidised pricing and a policy of energy-intensive industrialisation has led to consumption outpacing new supply. Consequently, even though 2017's exports were up sharply on 2015, they have fallen 30 per cent since 2003.

Abdelmoumen Ould Kaddour, chief executive of state oil firm Sonatrach, has done his best to turn things around, including trying to provide a more attractive hydrocarbons law, and luring in ExxonMobil to explore the virtually untouched offshore. But he has been held back by his company's bureaucracy and a lack of urgency in the rest of the government. Geoff Porter, a consultant on the country, notes rumours that Mr Ould Kaddour may be replaced.

Under the right leadership, the energy sector could be fixed, although it would be a long task. A previous reform effort, under Chekib Khelil, Oil Minister from 1999 to 2010, was undermined by vested interests and corruption allegations. With oil prices rising in his term, a liberal hydrocarbon law was replaced with windfall taxes and mandatory requirements for Sonatrach participation. Transforming Sonatrach's role and culture, speeding up the interminable approval of new fields, opening up more to international and private investment, attracting oil explorers into untouched parts of the vast Algerian territory, and reducing and targeting subsidies better, are all required. With among the best sunshine in the world, but little renewable energy deployment to date, solar power offers gas savings, job creation and possible electricity exports.

The country, though, has a long history of resource nationalism, dating back to its war for independence from France. Policies of privatisation are unlikely to be popular, whether under this government or a possible successor. An even more intractable problem is the system's reliance on petroleum revenues, and its inability to turn these into broad-based growth and jobs.

The Algerian economy features a heavy state hand, a lack of openness to international investment, and a reliance on creating employment through state jobs. Oil makes up 95 per cent of exports, in contrast to neighbouring Morocco, which has developed a promising manufacturing sector. Non-oil growth is only modest, and lower oil prices have led to wide budget and current account deficits in Algeria. Foreign current reserves, though still high, have halved since the oil price drop, and inflation has risen to 5 to 6 per cent as the government has printed money to cover deficits.

The state of petroleum markets has shaped Algerian politics before. In 1988, when the oil price collapse had undermined the economy, protests turned into lethal riots, and eventually into an opening up to democratic elections. With an Islamist party poised to win, the military's cancellation of those elections triggered the brutal 1990s civil war.

In 2011, Algeria suffered some protests against poor living conditions and political stagnation, if not on the scale of neighbouring Tunisia, Libya or Egypt, but these were repressed. With oil prices rising then above $100 per barrel in response to the Libyan revolution, Algiers was able to offer subsidies and higher wages to buy acceptance.

The economic position today is somewhere between those two situations. Foreign debt is almost zero, and growth is low but positive, so there is still room for some handouts and relaxation of austerity measures. However, this would only buy a little time for vital reforms, while risking squandering what breathing space remains. Algeria's economy exemplifies many of the failings of its peers. But a large population and territory, an enviable geographic location, and other natural resources, give it opportunities. To respond to the protesters, this government or another needs to resuscitate the energy sector and resurrect its economy.

KURDISTAN BOUNCES BACK WITH OIL REVIVAL BUT CHALLENGES REMAIN

Robin Mills • *A version of this article appeared in The National, Mar. 03, '19*

The markets in Erbil are busy again and the mood is more optimistic. With ISIS largely vanquished and oil exports booming, the Kurdistan region of Iraq has made a surprising economic recovery from deep crisis. It has a chance to learn from previous mistakes and put itself on a firmer footing, but there are still warning signs ahead.

In late 2016, with control of the Kirkuk-area oilfields secured by Kurdish forces following the mid-2014 fall of Mosul to ISIS, the autonomous region was exporting about 650,000 barrels per day. A hefty loan and payments for ownership of an oil pipeline from Russia's state giant Rosneft had given the Erbil government some financial breathing space. The settlement of a long-running arbitration case with Dana Gas of Sharjah opened the way for renewed gas development.

But the Kurds' disastrous and misconceived referendum on independence in September 2017, shooting themselves in the foot like Brexit, gave Baghdad the chance to exploit a split between the two main political parties and retake much of the disputed territories. The region's oil production was slashed to about 335,000 bpd and, with no share of the federal budget, it fell further into a financial crisis.

President Massoud Barzani had stayed on well beyond the expiry of his (already extended) term, which was part of the dispute between his Kurdistan Democratic Party and the Patriotic Union of Kurdistan, based in the southern Kurdish city of Sulaymaniyah. But following the federal election in May, the new government in Baghdad, headed by the economist and former oil minister Adel Abdel Mehdi, has taken a more conciliatory line. With its existing pipeline from Kirkuk to the Turkish border unusable because of ISIS sabotage, it has agreed to send about 100,000 bpd through the main Kurdish pipeline.

Border customs collection has been unified and Baghdad has been paying the salaries of Kurdish civil servants and the Peshmerga military. The wage bill has been cut, partly by eliminating "ghost" positions. The new budget promises the Kurdistan region about $9 billion of the federal budget, if it transfers 250,000 bpd worth of revenues to the federal treasury. The Kurdish government has finally been paying oil companies on a regular basis, encouraging them to make investments. Consequently, production has boomed. This has been led by the private Kurdish company KAR Group, which operates Khurmala, the northern most part of the Kirkuk field, still under Erbil's control. The new Peshkabir field, operated by DNO of Norway, part-owned by RAK Petroleum of Ras Al Khaimah, has quickly reached 50,000 bpd of output. Taqa of Abu Dhabi, operator of the Atrush field, has bought out half the stake of its erstwhile partner Marathon, and production there is now approaching 30,000 bpd.

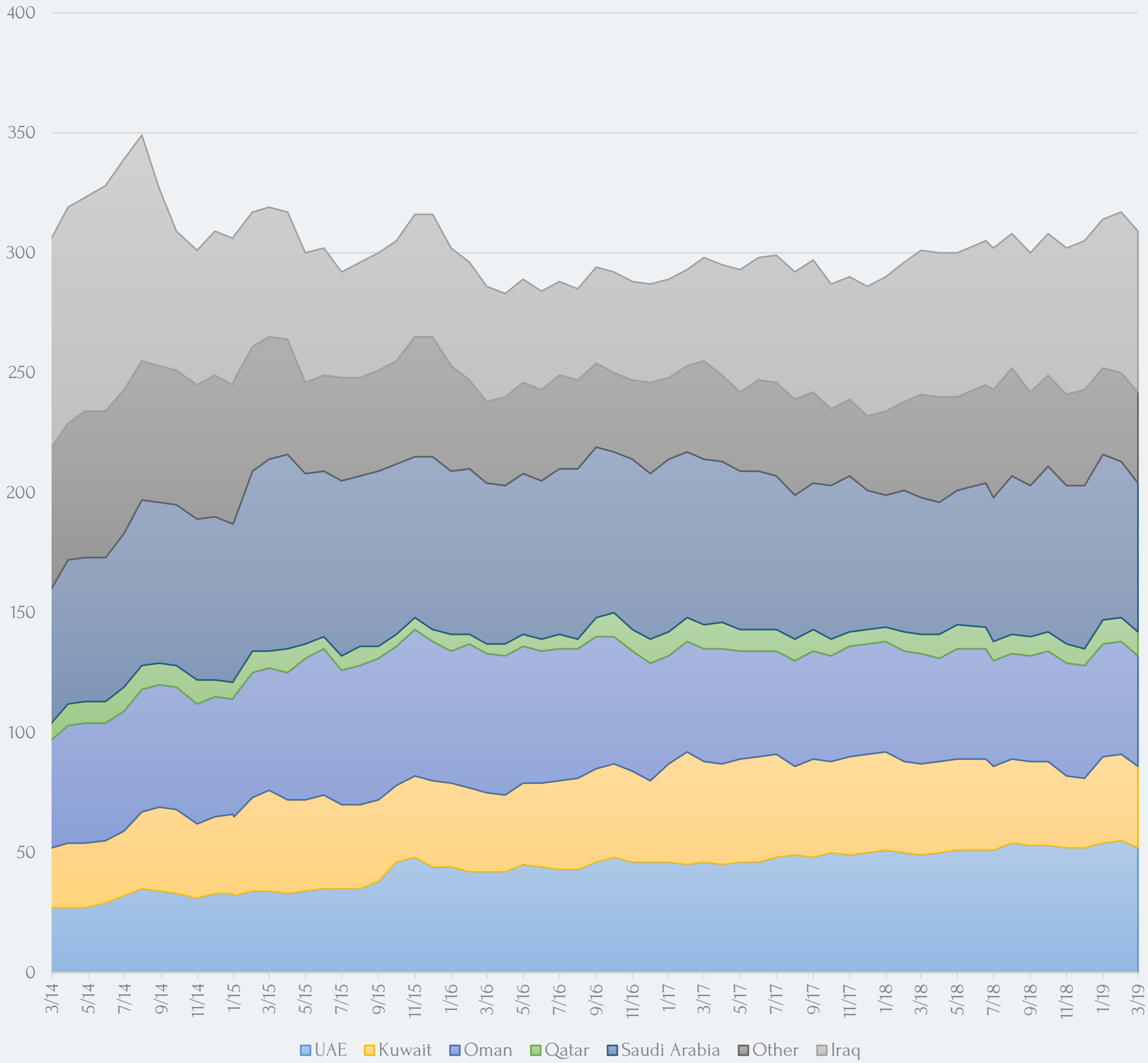
Several smaller fields have also made progress, with Genel Energy announcing last month development of the Sarta field in partnership with Chevron. Rosneft, which was awarded five exploration blocks as part of its series of deals in 2017, also aims to begin output this year. From their nadir, total exports have rebounded to about 430,000 bpd, bringing the region almost $9bn in gross revenues per year at current prices. Its rising output combines with the rest of Iraq's gains to put pressure on compliance with the OPEC deal.

But there are warning signs ahead: geological, economic and political. On the geological front, it has become apparent that the rugged Kurdish mountains and gorges hint at the complexity of the rocks below. Several fields have fallen short of expectations: production at Genel's flagship Taq Taq has collapsed from 140,000 bpd in 2015 to just 12,000 bpd. The reservoir rocks are highly fractured, and once oil is drained from these fractures, the underlying water enters production wells. Worryingly, the other large producing field, Tawke, held by DNO and Genel, has also recently started declining.

The region has long sought to exploit its large gas resources to meet domestic needs and then export to Turkey, which seemed under way with Rosneft's promise to build a gas pipeline. But it is now unclear whether the Turkish economy, in danger of recession and set to receive additional Russian supplies at the end of this year, needs to buy much more gas. Electricity subsidies and non-payment at home remain a heavy drain on the budget, too. Despite recent rain, the region, like the whole of Iraq, faces a growing water crisis from drought and dams on its rivers upstream in Iran.

The thorny issue of disputed territories also remains, with specialist journal Iraq Oil Report recently investigating DNO's drilling in the contested Baeshiqa area near Mosul. The end-game in eastern Syria risks further spill over of refugees and ISIS fighters into the adjoining parts of Iraq. And the Kurds are unlikely to meet the requirement to transfer 250,000 bpd of oil export revenues to the federal government, concerned this would jeopardise their financial independence. The economy is still undiversified, government roles still allocated by patronage and nepotism, and the budget mostly dependent on oil, whether from the Kurds' own or their share of earnings from Basra. The regional authorities need to heed the warnings that oil production may not keep increasing and is even in danger of dropping, unless new developments and exploration are expedited. As the region seems to have more gas than oil, securing markets for it – whether at home, in Turkey or in the federally-controlled part of Iraq – is essential. Whether independent or autonomous, the region faces the acute challenge of sustaining economic viability.

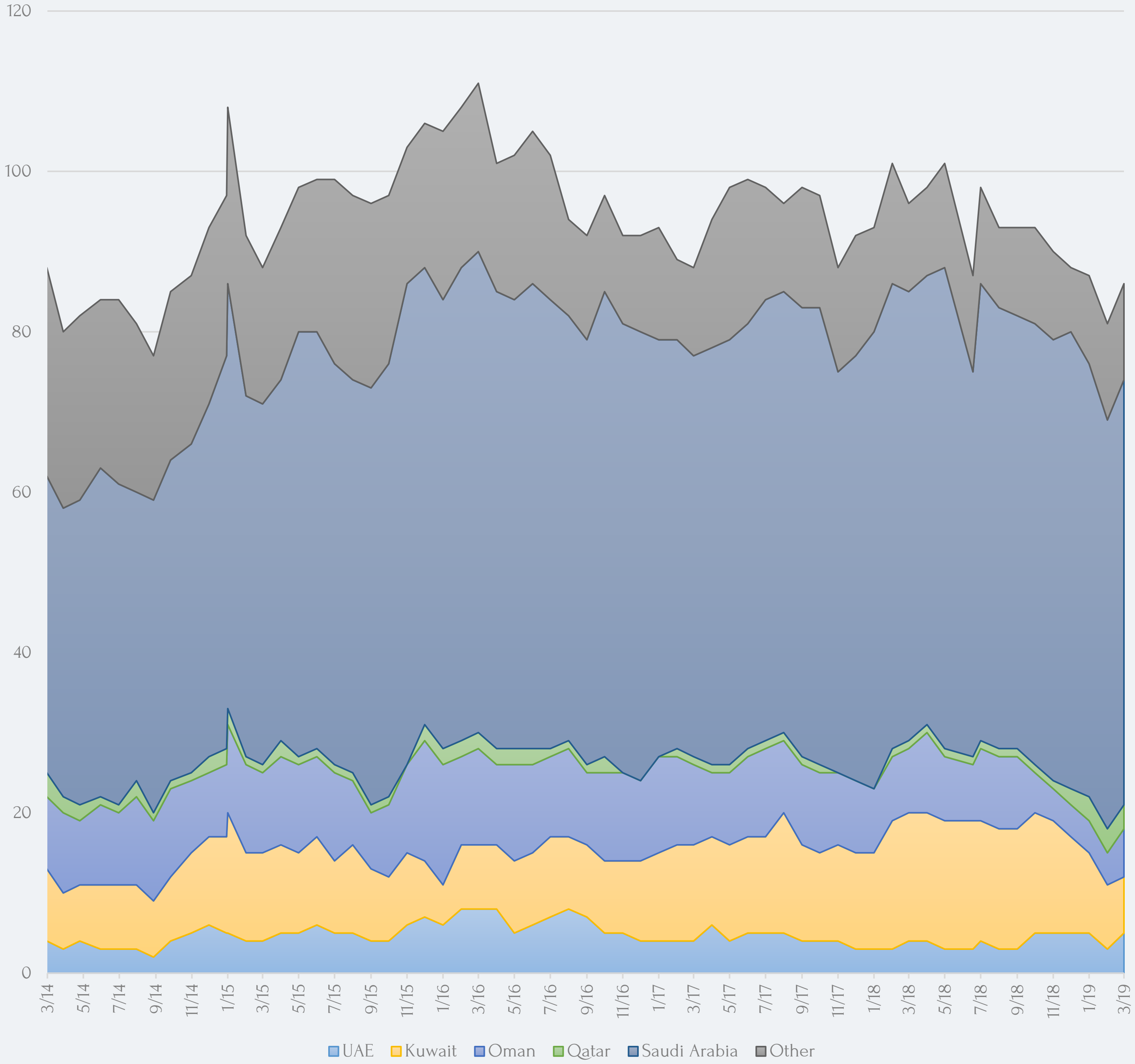
RIG COUNT SNAPSHOT: **OIL**



- The Middle East's rig count in March fell by -8, excluding Iran. Iran's rig count is not included in Baker Hughes; OPEC reports total (oil and gas) rig count in Iran at 61 throughout 2017, till November 2018. According to Iranian media, Iran had 104 total (oil and gas) active rigs in November 2018, which is extremely doubtful, due to falling production and deteriorating exports.
- The fall in rig counts is due to OPEC's decision to curb production in order to balance the oil market, with the Gulf-3 combined witnessing a drop of -8 in their rig count.
- Iraq's rig count witnessed no change in March, after increasing to 67 in February, the highest level since April 2014, which has cast doubt over Baghdad's OPEC compliance. Production from state-operated fields Majnoon, Luhais, Tuba, Ratawi, and Nahr bin Omar has been cut back by >200 kbpd, but internationally-operated fields continue to make gains.
- The UAE's rig count fell back to its Q4 2018 average, following from ADNOC's confirmation of a 15% and 5% cut in the allocations for the Murban and Upper Zakum and Das grades respectively, and increasing their premiums.
- Kuwait's rig count fell by -2, even though OPEC compliance was 118%. Resuming production from the Neutral Zone will remain on hold, not just due to political and technical disagreements, but also because of Saudi Arabia's insistence to bring global oil inventories down to "the 5-year average".
- Saudi Arabia's rig count fell by a combined -7 over February and March, as production fell by a total of ~500 kbpd since January, in the country's bid to push for a tighter market.

Source: Baker Hughes

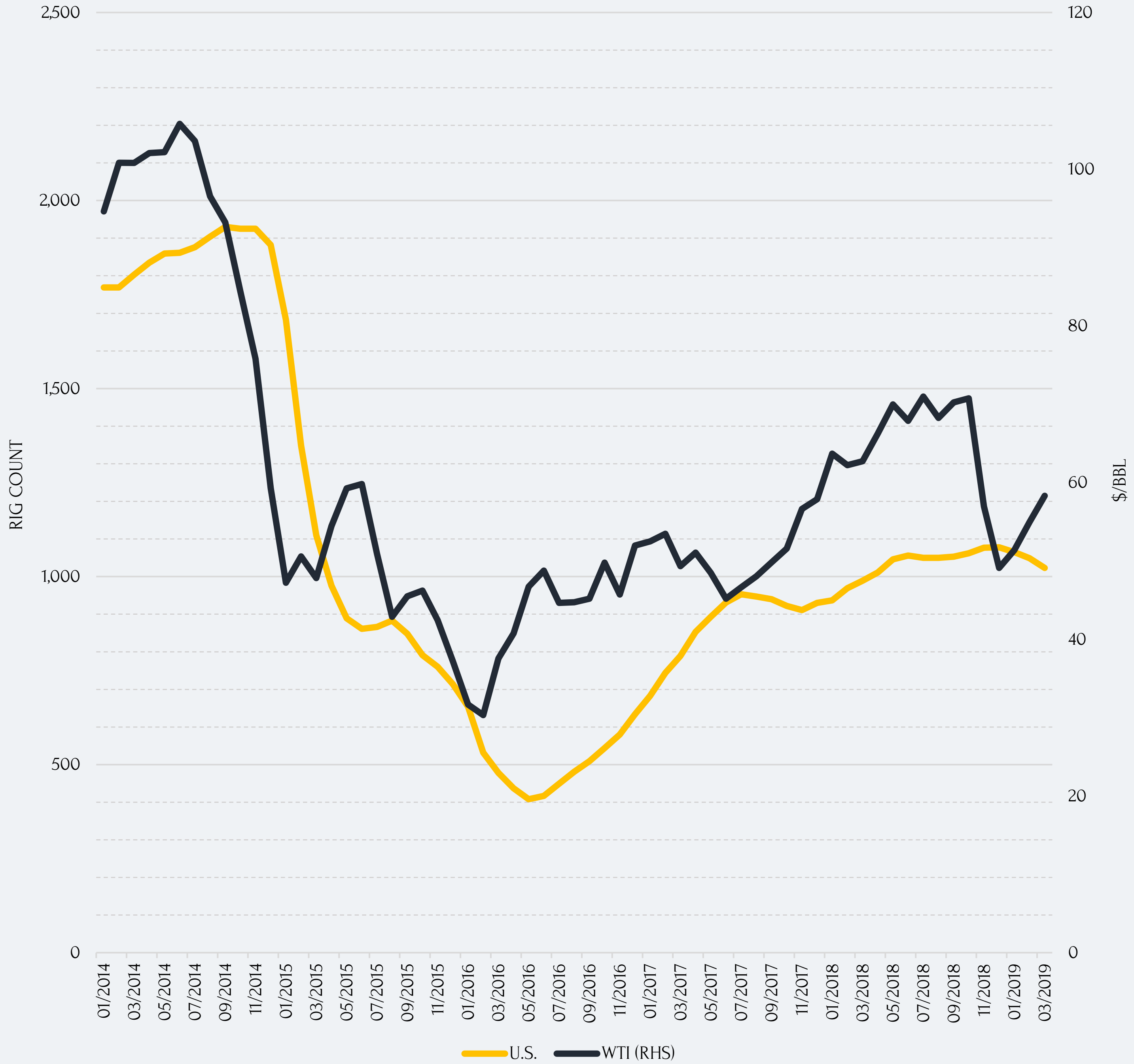
RIG COUNT SNAPSHOT: **GAS**



- The Middle East's overall rig count gained by +5 in March, yet still a drop of -15 from its year high count of 101 in May 2018. The region reached a high of 123 gas rigs in January 2014, but has since then declined, averaging 99 in the last four years. We could see this trend reverse as major gas expansion plans get underway in the UAE, Saudi Arabia, Oman and Qatar.
- Oman's rig count gained by +2 in March, about -4 rigs below its April 2018 high of 10, even as the Oman Oil Company Exploration and Production (OOCEP) signed an EPSA with Eni for tight gas development onshore Block 47 on January 14.
- Kuwait's rig count fell by -1 to 7 rigs, the lowest since January 2016, even as it targets increased non-associated gas production to meet soaring gas demand. Jurassic gas production is expected to grow from 170 MMscf/d to 520 MMscf/d, but the fields are expected to become operational now only by 2023-24, and will contribute to Kuwait increasing output to 3.5 Bcf/d by 2031-32.
- The UAE's rig count witnessed no change from its Q4 2018 average, remaining steady at 5. On March 17, ADNOC awarded Inpex oil and gas exploration rights for onshore Block 4, and on March 26, to an Indian consortium for onshore Block 1.
- Saudi Arabia's rig count gained by +2, -3 lower than its 2018 average of 56, as it seeks to expand gas production. On March 10, the semi-official Saudi Gazette reported a gas find of massive volume in the Red Sea, but amounts have not been specified. Aramco is aiming to be one of the biggest five LNG producers in the world in 15 years with its overseas projects.

Source: Baker Hughes

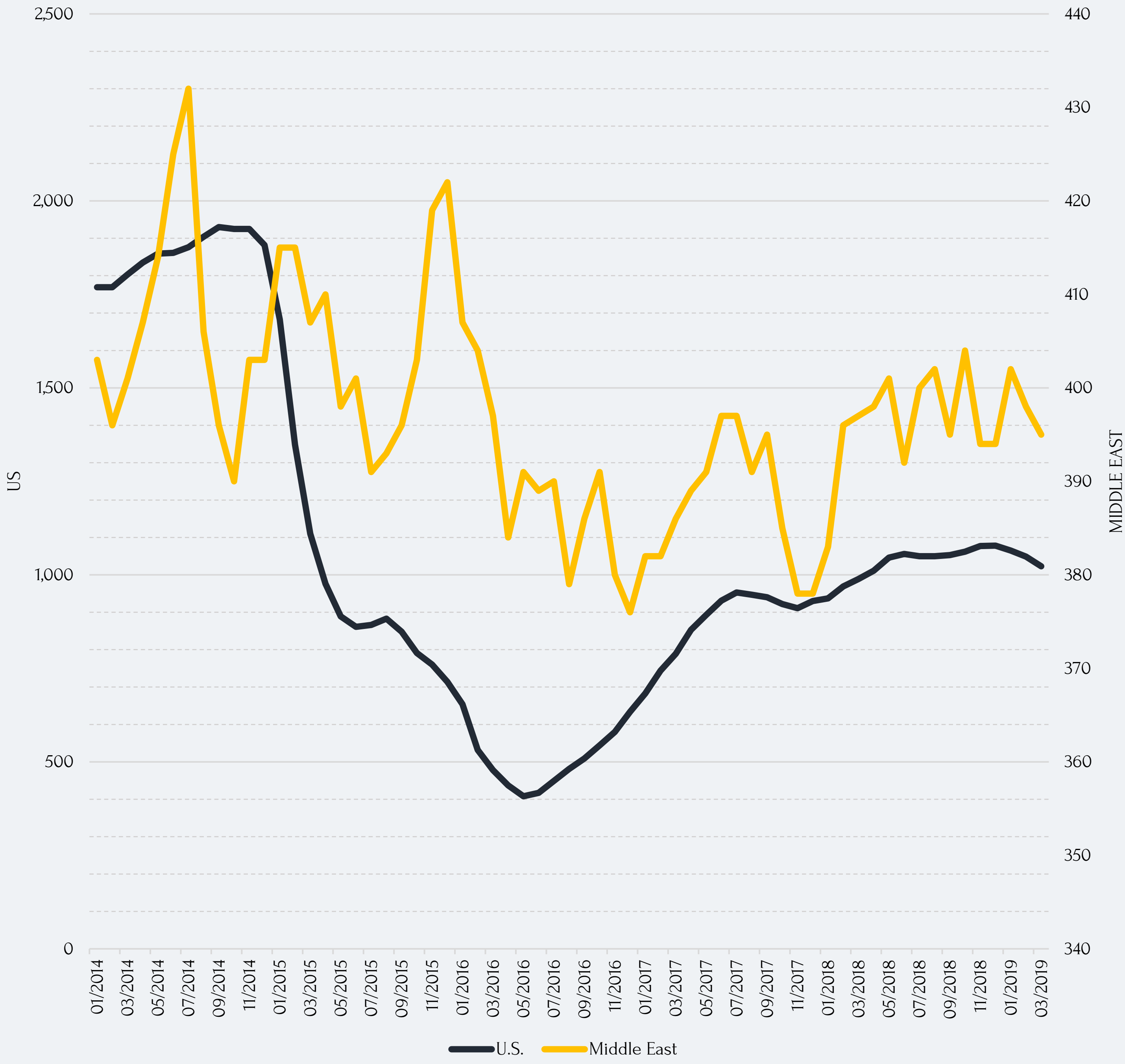
RIGS VERSUS OIL PRICES: US RIGS & WTI



- US rig count gained only by 3.4% in March 2019, y-o-y from March 2018, an increase of +34 rigs.
- Total US rig count fell to 1023 in March 2019 against February 2019, the third straight drop in over 7 months (-26), and the biggest fall since February 2016. This is indicative of producers trimming spending plans due to rising debts, even though oil prices are making a recovery. Operating costs in the Permian Basin have not reduced, even though it has better economics than other basins. The fall in number of rigs reveals the need for higher prices to pump in more supply. The EIA expects US production to average 12.1 Mbpd in 2019, up from an estimated 10.9 Mbpd in 2018.

Source: Baker Hughes, EIA

RIG COUNT: US & MIDDLE EAST



- The US' offshore rig count gained by +10 y-o-y from March 2018 even though Hurricane Florence had raised concerns of a similar fall in rig count as was observed during Hurricane Harvey and other natural disasters. Onshore rigs increased only by +6 y-o-y from March 2018, indicating a slowing down of spending plans by independent shale producers.
- Total Middle East rig count fell below its 2018 average of 396 rigs to 395 rigs in March, as major producers, such as Saudi Arabia, the UAE, and Kuwait, curtailed production. Saudi Arabia's plans to bring online 300 kbpd of output from Khurais will remain subdued as long as the OPEC cuts continue, while Iraq will further curb production from its state-operated fields.

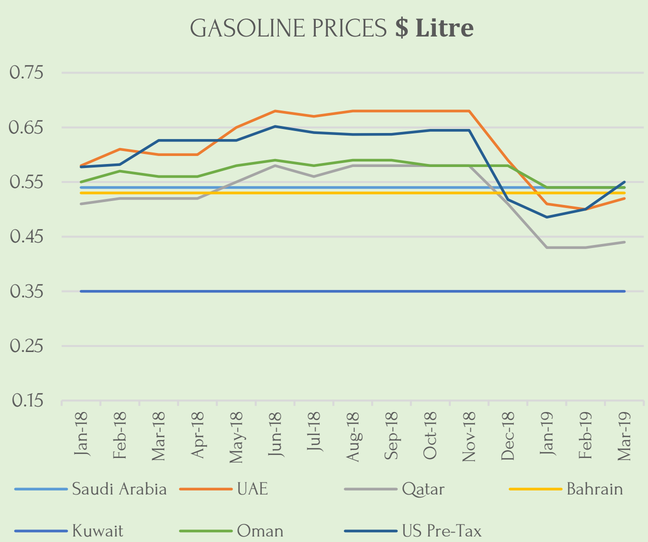
Source: Baker Hughes, EIA

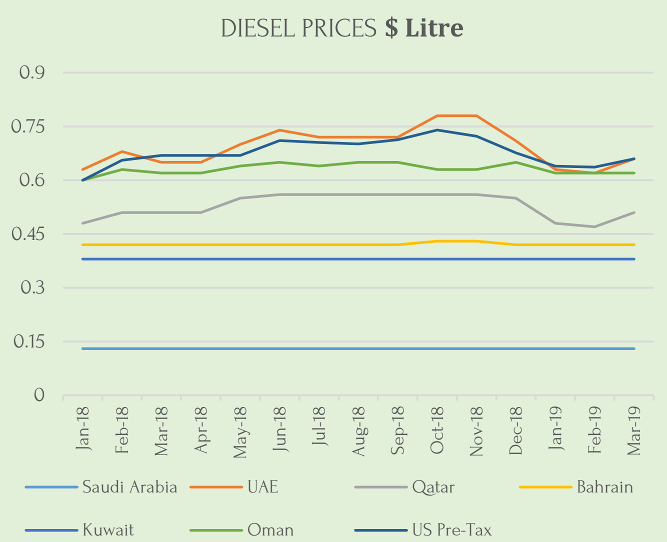
FUEL PRICES & SUBSIDY REFORMS

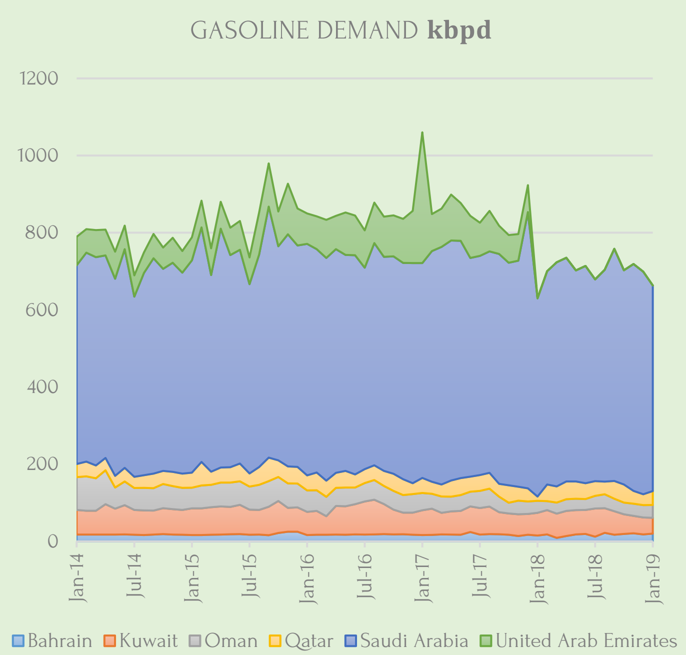
MARCH 2019

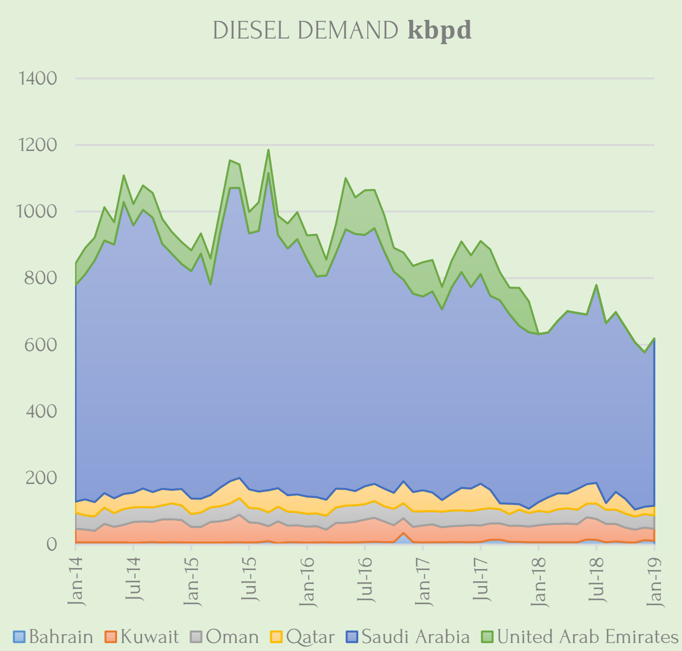
- After four months of easing prices, gasoline and diesel prices in the UAE increased in line with rising global prices, by 4% and 6% respectively.
- Similarly, in Qatar, prices for gasoline and diesel rose by 2% and 9% respectively in March, having dipped in early-2019 due to the period of softer oil prices. Prices however remain below November 2018's levels, the highest recorded in 2018.
- In Oman, the price of M95 and diesel, which decreased by 6.9% and 5% respectively (in line with low oil prices) in January, had no change in February or March.
- In Kuwait, the Parliament's Financial and Economic committee has approved the cancellation of the decision enforced in September 2016 to raise fuel prices to 'reduce financial burdens on citizens'.
- Similarly in Bahrain the Council of Representatives urged the government to rethink its fuel price hike just a day after it was approved, finding the change 'too sudden'. In May 2018, the High Administrative Appeals Court dismissed the complaint, allowing the Ministry of Oil & Gas to raise fuel prices from September 2018 but this decision hasn't come into force yet.

The following charts represent the prices of gasoline 95 and diesel ($/litre) till February 2019 in the GCC countries.









***Note:** UAE figures for 2018-19 are not available.*

Source: EIA, JODI, Qamar Energy

JORDAN SET TO EXCEED ITS 2020 SOLAR TARGET WITH CONTINUED GROWTH

Roa Ibrahim • *Consultant*

Jordan is one of the leaders in solar growth in the Middle East North Africa (MENA) region, alongside Israel, the UAE and Morocco. Jordan's renewable energy penetration in 2017 stood at 13% of its generating capacity compared to 1% in 2012 (including biogas). The Hashemite Kingdom imports around 96% of its energy sources and is the top 6th energy importer in the world[1] but has one of the lower Nominal GDP rankings[2], coming in 90th. Struggling to implement much needed economic reform, this puts the country in a tight fiscal position and at greater risk of continuing social discontent. Any measures to reduce energy import dependence, such as renewable energy, is a great step forward for the country, if it implements the right infrastructure upgrades.

By end-2017, Jordan's total generation capacity reached 4,529 MW, including the industrial sector's own generation, of which 396 MW is solar and 198 MW is wind capacity, as shown in Figure 1. This compares to 5 MW of solar in 2015 and 1 MW of wind in 2014. According to the Middle East Solar Industry Association (MESIA), including smaller projects of 10 MW capacity and below, solar capacity reached as high as 641 MW by 2018. In 2017, the 103 MW Quweira plant was completed and Al Potash industrial company added 33 MW of solar capacity. The remaining is mostly likely attributed to small scale solar rooftop and wheeling projects. Other renewable energy capacity includes 12 MW of hydro from two plants, though growth is stagnant, and 4 MW of biogas.

In Jordan solar PV farms (grid connected) are dominant while CSP needs further development as it is a more expensive technology. For now, solar thermal technology has been mostly used for rooftop water heating in the residential, hotel and industrial sectors. A sound 15% of households are equipped with solar water heating systems and the government plans to increase it to 30% by 2020[3]. Despite no progress in CSP farms, the country was able to launch an energy storage project with PV technology. In February 2019, Philadelphia Solar (EPC contractor) launched the second phase (11 MW) of its energy storage project. The company's 23 MW solar PV plant with a 12.6 MWh energy storage component was developed in 2 phases of 12 MW in October 2015, and 11 MW in February 2019.

According to Wood Mackenzie, solar-plus-storage will become more attractive in Jordan than combined cycle plants (CCGT) by 2019/20. Jordan's CCGT fuel costs are high due to reliance on imported LNG and regional pipeline gas, ranging from $5.60 to $6.80/MMBtu (around $62-70/MWh). Solar-plus-storage costs ranging between $60 and $100/MWh are therefore approaching viability. LCOE for solar-plus-storage will also drastically decline by 2023 and will become even more competitive than CCGT costs in Jordan[4].

The industrial sector's own generation is mostly from steam turbines which are oil-fired, but some large industrial players like Al-Rashadih Cement Co. and Al-Potash Co. have integrated renewable energy in their operations and have a combined 50 MW of solar capacity. Solar energy for large industries is gaining traction as their tariffs go as high as 17.5 $c/kWh during the day, 15.4 $c/kWh during the night and 4.2 $c/kW/m during peak hours. Round III's 150 MW solar PV projects are now assigned to large-scale industrial projects.

[1] The Global Economy
[2] IMF 2018
[3] Ecomena: https://www.ecomena.org/solar-energy-jordan/
[4] https://www.greentechmedia.com/articles/read/solar-storage-beats-combined-cycle-gas-in-jordan-and-morocco#gs.4a7ojp

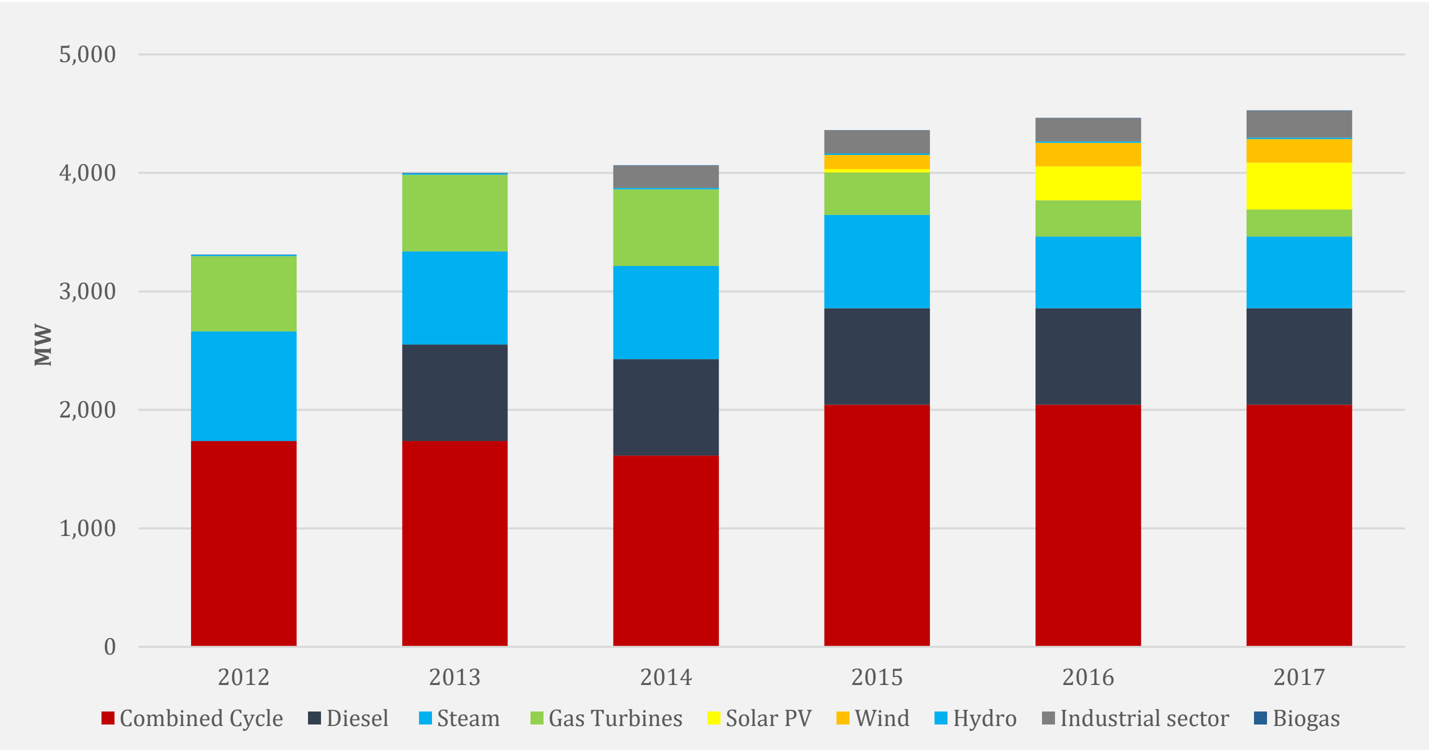


Figure 1 Jordan's installed capacity (Source: NEPCO; IRENA)

The growth in solar stems from several factors: high energy import bills, the challenge of dealing with Syrian refugees which led to a boost in electricity demand, energy subsidies being largely eliminated, encouraging rooftop and distributed installations, a growing local solar and wind EPC/developer sector improving technical skills, and successful implementation of net metering for distributed power and tendering processes for utility scale projects. Small-scale renewable energy systems are also on the rise as they are exempt from all taxes and are backed by attractive financing from local banks (10 years payback, 4-6% interest rate). The National Electric Power Company (NEPCO) plans to add 244 MW of small solar systems (<5 MW of net metering and wheeling projects) by 2021.

Another 869 MW of solar is expected to come online by 2021, most of which is already under construction (617 MW) and the rest awarded/tendered[5]. Jordan is targeting 1.2 GW of solar energy by 2020, yet with the current projects in the pipeline, it may exceed the target and reach 1.5 GW by 2021, prompting it to set more ambitious targets longer-term.

However, the success comes with challenges, mainly with the integration of renewables to the electricity system. In January 2019, the government suspended granting any approvals for renewable energy projects of more than 1 MW until grid capacity has been assessed. This restriction does not include Round III PV and wind auction programme, though the announcement of the winners was also delayed in October 2018 due to the undecided size distribution of the winning projects[6].

The expansion and reinforcement of the grid is already under development as part of the green corridor program that will increase the country's grid capacity from 3.6 GW to 4.6 GW. However, the project is focused on the already existing grid infrastructure and will not connect the south-eastern part of the country that is most promising for solar energy. Moreover, the majority of the solar PV farms currently under construction are located in and around the Ma'an region in southern Jordan, whereas the majority of power consumption is from the capital Amman (north-central Jordan and the most populated city). If the grid capacity issue is not resolved, Jordan's growth in solar penetration could be scaled back as investors lose confidence.

[5] MESIA
[6] PV Magazine

ARABIA MONITOR ENERGY:

A Collaboration Between Arabia Monitor & Qamar Energy

ARABIA MONITOR ENERGY

Oil and gas tensions in the Middle East continue to influence the volatility of the world's energy markets. The Arabia Monitor Energy, a novel collaborative effort by Qamar Energy and Arabia Monitor, combines macroeconomics, geopolitics and energy intelligence to explain what the region's energy geo-economics mean for business.

WHAT SETS IT APART?

1. INSIDE OPEC

Focussed assessment of the month's OPEC developments, policy advancements and strategies.

2. NOC & IOC ANALYSES

Examination of factors affecting NOC and IOC policies, and their impact on regional diversification schemes.

3. SPOTLIGHT THIS MONTH

Targeted reading of the geopolitical, macroeconomic and energy landscape of a MENA country utilising our specialised energy intel.

4. SCENARIOS TO WATCH

Detailed forecast of global oil developments and their impact on the risks and opportunities for MENA's oil production.

5. STRATEGIC IMPLICATIONS

Concise summary of major oil trends and their effect on investment strategies under bearish, bullish, and wobble scenarios.

6. OUTLOOK FOR THE YEAR

Cohesive outlook of the oil production, gas production, renewable energy projects, and geopolitics of key MENA countries.

WHO BENEFITS?

ENERGY TRADERS

- What factors will contribute to oil and gas price fluctuations?
- What is the outlook for oil and gas pricing?
- What is the outlook for OPEC's production and export strategy?
- How are NOCs adapting their oil marketing strategies?

INVESTMENT AND RISK ANALYSIS

- What are the operational risks and investment opportunities in MENA?
- How do economics, politics, government policy changes, production and export bottlenecks contribute to risk mitigation?

UPSTREAM FIRMS

- What are the chief economic, political and fiscal regime factors driving/limiting upstream investment decisions and progress?
- What are the oil supply outlooks for the countries by project?

DOWNSTREAM FIRMS

- What are the demand challenges, patterns, and trends for oil and oil products?

NATIONAL OIL COMPANIES

- What are future oil and gas pricing trends?
- What developments will intensify or weaken demand?
- What are IOCs' incentives and drawbacks in operating in the country?

ALTERNATIVE / RENEWABLE ENERGY ORGANISATIONS

- What are the challenges to renewable energy targets?
- What is the progress of major renewable energy projects?
- Are there opportunities for more entrants?

THE DELIVERABLES

8 MONTHLIES

- Oil Price Scorecard
- Headline Developments
- Spotlight this Month
- Scenarios to Watch
- Projects in the News
- Macro Dashboard for Oil Exporters/Importers
- Outlook for the year

4 QUARTERLIES

- MENA Map as per Political Grouping
- Map of New Licensing Rounds
- Political & Regional Security Issues
- Oil & Gas Prices Outlook
- Global Barriers to Oil & Gas Production
- Deep Dive into OPEC & NOPEC
- MENA Energy Investments
- MENA Energy Fiscal System
- MENA Energy Upstream Bidding map
- MENA Economic Outlook
- Probability Scorecard for Bearish & Bullish Oil Supply/Demand
- Investor Implication Scenarios (Under 3 Oil Price Dynamics)

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Qamar Energy provides leading-edge energy strategy, commercial and economic consulting across the energy spectrum.

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MAXIMISING REVENUE

INCREASING SUPPLY NETWORK AGILITY

DEBOTTLENECKING SHORTCOMINGS

WE TARGET

ENERGY MAJORS
OIL & ENERGY TRADERS
INTERNATIONAL OIL COMPANIES
NATIONAL OIL COMPANIES
UPSTREAM FIRMS
DOWNSTREAM FIRMS

WHY US?

ECONOMICAL OVERHEADS
NO HIDDEN COSTS
INHOUSE PROCUREMENT
PAYMENTS LINKED TO RESULTS
SPECIALISED MODELS
EXECUTION ACROSS FULL STREAM

OUR SERVICES

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- COSTS ASSESSMENT
- RESOURCE MANAGEMENT
- VENDOR MANAGEMENT
- IN-HOUSE PROCUREMENT
- TENDERING & CONTRACT MANAGEMENT

Qamar Supply Chain Consultancy streamlines the management of procurement and sourcing in the Middle East's energy sector to drive efficiencies and added value. Our extensive regional and global network spans every sector of the energy spectrum: upstream, midstream, and downstream.

We complete our diagnostic and recovery services in one full week, followed by a detailed value and costs assessment to strategise procurement and categorise spend. The final execution and implementation of our changes is always personalised to different needs, and can span a period of 4 to 12 months.

OPEC WATCH

AVERAGE CRUDE PRODUCTION FOR FEBRUARY 2019

30.55 Mbpd

- 221 kbpd

From January 2019

Non-OPEC Oil Supply*

68.60 Mbpd

- 06 kbpd

from January '19

*including OPEC NGLs

Non-OPEC Crude Output

United States

Brazil

Kazakhstan

OPEC & Non-OPEC COMPLIANCE

- Overall OPEC compliance was at 97% for February, with the largest cuts coming from Saudi Arabia (170%) and Kuwait (118%) among the key producing countries.
- Russian production declined by a meagre 4 kbpd from January's levels of 11.38 Mbpd, even though compliance improved to 36%. In January, Russian compliance was at 18%.
- Nigeria has shown hesitance at complying with the cuts, even though production witnessed a rise of only 10 kbpd in February. Nigeria is soon to hold national elections which makes complying a danger to political stability. Its compliance was -6% in February.
- Oman's compliance reached 136% in February, the third highest after Saudi Arabia and Angola (151%) , producing 969 kbpd, 34 kbpd less than its reference production for October.
- The UAE had the lowest compliance among the big Gulf-3 producers (Saudi Arabia and Kuwait being the other two) at 100%, cutting output by just 4 kbpd.

NEXT OPEC MEETING: June 2019

176th (Ordinary) OPEC Meeting in Vienna, Austria

LATEST ORGANISATIONAL CHANGES

- At the 175th Ordinary OPEC meeting in December, OPEC members pledged to cut overall production by 0.8 Mbpd, while Non-OPEC members volunteered a cut of 0.4 Mbpd. These were based on October 2018 levels, and came into effect on January 1, 2019. Exempt OPEC members include Iran, Libya, and Venezuela.
- The agreement is slated to stay in force till June, and a decision on its extension will be discussed at the 176th Ordinary OPEC meeting in June 2019.
- Venezuela has assumed the rotating OPEC Presidency for one year, effective as of January 01, even though uncertainty shrouds the PDVSA and oil production.

OPEC PRODUCTION

- Libyan production rose by 23 kbpd in February, and looks set to grow further now that the 340 kbpd El Sharara field has been brought online. Renewed output from the field would return Libya's output to 2018's >1 Mbpd levels.
- Iraq's output witnessed a decline of 70 kbpd from the previous month as the country battles to reach its 2019 targets while maintaining compliance with the OPEC cuts.
- Saudi production decreased the most of all OPEC members (by 86 kbpd) to remain 143 kbpd lesser than its pledged output. Saudi has been making up for lower compliance from other major producers like Russia.
- Iran's output has reached stagnation, with February's output inching forward by only 12 kbpd. Overall, the country has lost 1.075 Mbpd in production from its 2018 high of 3.818 Mbpd.
- Political instability and threat of civil disturbances have all but eliminated chances of a revival in Venezuela's production, which is struggling to remain above 1 Mbpd. February's production was 1.008 Mbpd.

KEY MENA ENERGY SCORECARD

MARCH 2019

QATAR DEVELOPMENTS

Qatar plans to order 60 new LNG carriers to increase its LNG shipping abilities and reach its 2024 goal of expanding LNG send out capacity by 30% from the current 77 Mtpa to 100 Mtpa; Qatar Petroleum signed an agreement with Eni to acquire 30% in the offshore Tarfaya concession, including 12 exploration blocks off Morocco, with Phase-1 exploration concluding in 2020; QP had also signed a deal with Eni to acquire 35% in three fields in Area 1 of the Campeche Bay complex offshore Mexico, increasing its overall share in Area 1 to 50%; QP will take over the Idd el-Shargi North Dome oilfield from Occidental once the PSA expires in October 2019; QP may increase LNG exports to Pakistan by an additional 1.4 Mtpa on top of the already-existing 3.76 Mtpa export contract.

MENA ENERGY PRICE REFORM

UAE will gradually scrap subsidies on electricity and gas sold to power generators to reflect 'real' prices by 2030; In Q2 2018 the Bahrain High Administrative Appeals Court dismissed the Council of Ministers' complaint to rethink a fuel prices hike, allowing the Ministry of Oil & Gas to raise fuel prices from September 2018, but this has yet to take effect; In June 2018 Egypt announced increases in fuel prices as a part of its $12 B IMF loan: M92 and M95 gasoline saw a hike of ~36% and 16.2% and electricity and water prices rose by 26% and 5% respectively; Saudi Arabia has introduced the Citizen's Account Program, a cash handout scheme for low-income Saudi citizens impacted by rising fuel prices, electricity tariffs, and VAT.

FEDERAL IRAQ DEVELOPMENTS

Iraq's exports in February fell by 142 kbpd from January's record levels of 3.996 Mbpd; Production has already been cut from the state-owned oilfields of Majnoon, Luhais, Tuba, Ratawi, and Nahr bin Omar; Baghdad is nearing a deal with Exxon and CNPC for a multi-billion dollar deal to expand southern export capacity to 6.5 Mbpd, as well as build infrastructure under the Common Seawater Supply Project that has repeatedly been put on hold; The Federal Supreme Court has ruled the Iraq National Oil Company (INOC) law unconstitutional, which will necessitate it being re-drafted again; Baghdad has allocated $9 B to the KRG as part of its national budget for 2019, contingent on the KRG sending it 250 kbpd of exports, but the KRG is unlikely to send this, which will bring its share of budget down to $ 3.89 B.

MENA NUCLEAR POWER

Saudi Arabia is assessing Umm Huwayd and Khor Duweihin for its first nuclear power plant near the UAE and Qatari borders and has shortlisted Rosatom and KEPCO, among others. Tendering is set for 2020, but will face delays due to technical plans, and negotiations with the US, even though MBS launched a programme for the Kingdom's first nuclear research reactor in November, which appears to be nearing completion. Agreements for fuelling and operation are yet to be signed; The UAE's Barakah plant now looks delayed to 2021 due to lack of operational readiness. The start-up of the first reactor has already been held up by inadequate training of operating staff. Overall completion is just under 90% (Unit 1: 100%, Unit 2: 94%, Unit 3: 86%, Unit 4: 77%); Egypt and Rosatom will begin construction on the $21B Dabaa nuclear plant in 2021 with financial support from the Russian National Wealth Fund.

No Change ⇔ Very Positive
Deterioration in the last month ⇩ Positive
Negative
Improvement in the last month ⇧ Very Negative

KEY MENA ENERGY SCORECARD

MARCH 2019

ENERGY INFRASTRUCTURE SECURITY

El Sharara, Libya's largest producing field, continues to face threats to its production due to outbreak of fighting between the LNA's forces and militias in Tripoli and near the Zawiyah Port. On December 09 Libya had declared force majeure at the oilfield after a local militia group took control of the field. The field's production has returned to capacity levels, even though onsite damage has to be addressed. Now with the field under the control of the LNA, who took over from the Petroleum Facilities Guard (PFG), field marshal Haftar has gained confidence to advance his forces towards Tripoli and try take control of the Tripoli-based, UN-recognised National Oil Company (NOC).

ABU DHABI DEVELOPMENTS

ADNOC awarded 100% stake to an Indian consortium (Bharat Petroleum and Indian Oil) for onshore Block 1. The area covers the separate Ruwais Diyab tight gas concession, being explored by Total. The Indian companies will target conventional oil and gas only; ADNOC also awarded in March onshore Block 4 to Japan's Inpex; Earlier in the year, it awarded Eni a 70% stake in Offshore Blocks 1 and 2 which allegedly share "virtuous synergies" with the Ghasha ultra-sour concession which was also awarded to Eni alongside OMV; Ghasha is expected to produce over 1.5 Bcf/d by 2025 in line with UAE's goal of boosting natural gas production ADNOC has also announced increasing output from its Shah sour gas field to 1.5 Bcf/d and developing sour gas fields at Bab and Bu Hasa; ADNOC is looking to hold a second bid round to discover new opportunities in conventional and unconventional plays in oil and gas, to boost capacity to 5 Mbpd by 2030.

IRAN DEVELOPMENTS

Iran's February exports dipped by 127 kbpd in February, even as Japan and South Korea placed orders for crude before the sanctions' waivers expire on May 04; logistics, shipping insurance, and payment channels still remain the most significant deterrent for customers; on March 20, the U.S granted Iraq another 90-day extension to the initial 45-day waiver; Iraq remains heavily reliant on Iranian gas for energy feedstock; on January 31 the EU formally established the Instrument for Supporting Trade Exchanges (INSTEX), and said it will become operational in the "coming weeks"; Iran's renewables capacity has increased to 670 MW, with a further 445 MW planned by end-2019; Iran is planning to build a 1 GW solar park in the central province of Markaz by 2022 but delays are likely due to access to finance.

KUWAIT DEVELOPMENTS

Indian firm Larsen & Toubro has submitted the lowest bid for the Mina Ahmadi gas pipeline which will link gas fields in the north to the Mina Ahmadi refinery for an estimated $479 M; Vietnam's 200 kbpd Nghi Son refinery, partly owned by Kuwait Petroleum (35.1%) has begun operations and sent its first gasoline export cargo in September; State-owned Kuwait Petroleum Company (KPC) is set to announce $5.2 B worth of oil and gas related projects over the next five years, though details of the plans have not yet been released; Talks with Saudi Arabia to restart up to 500 kbpd of locked-in production from the Neutral Zone fields of Khafji and Wafra by end-2018 have once again been delayed due to political disagreements.

No Change ⇔ Very Positive
Positive
Deterioration in the last month ⇩ Negative
Improvement in the last month ⇧ Very Negative

MENA RENEWABLE ENERGY

REPDO is planning to tender 12 solar PV projects in Saudi Arabia with a combined capacity of 3.1 GW in 2019 (of which 7 solar PV projects, with a capacity of 1.515 GW, had EOIs due on February 14) after revising the country's solar targets from 5.9 GW to 20 GW for 2023, and RE target from 9.5 GW to 27.3 GW; it has also set a new 2030 target with 40 GW of solar and 58.7 GW of RE; ACWA Power has won Bahrain's 100 MW PV tender for a solar park at the Askar landfill site. ACWA submitted the lowest bid of $0.039/kWh; Emirates Water & Electricity Company, formerly ADWEC, has launched a tender for a 2 GW solar project at Adhafra; Dubai Electricity and Water Authority (DEWA) has issued a request for qualification for a further 900 MW of PV at the Mohammed bin Rashid Al Maktoum Solar Park. The park is planned to reach a final capacity of 5 GW; Delays with the Barakah Nuclear Plant have pushed back the UAE's 27% clean energy target for 2021, but targets for 2050 are still on track; Masdar has begun installing the first of 13 turbines in Dhofar, Oman which is the GCC's first and largest wind farm generating 50 MW to power 16,000 homes in Oman. It is set to be completed in September 2019; Libya's Misurata Free Zone (MFZ) has signed an MoU with consultancy iQ Power to develop integrated CSP and PV projects with up to 300 MW total capacity, but highly subsidised prices and insecurity will keep investment subdued; Tunisia has awarded contracts for six 10 MW solar projects under the country's second solar tender. The winners will sell power to state-owned utility Société Tunisienne de l'électricité et du gaz (STEG) under long-term PPAs.

MEDITERRANEAN GAS COMMERCIALISATION

ExxonMobil has made the world's third largest gas discovery in 2 years offshore Cyprus at the Glaucus-1 well, estimated to hold between 5-8 TCF; More drilling is to take place offshore Cyprus in 2019 as majors Eni, Exxon and Total continue to hunt for big discoveries; In Lebanon Total and Eni are planning their first exploration well in Block 4 by the end of 2019. A second bid round is scheduled to be offered in Q4 2019, but the country's inability to form a government may postpone it indefinitely; Eni has encountered gas under evaluation in the Nour exploration prospect and will begin feasibility studies to accelerate exploitation; Egypt has begun increasing its gas exports as the export terminals of Idku and Damietta in the north restart; BP is set to boost production from the West Nile Delta to 700 Mcf/d by April 2019 under its second phase (Giza and Fayoum fields) of development; Italy's Edison is preparing two wells for 2019 in its Thekah and Hapy blocks which lie between Nour and Zohr; Dana Gas is also set to drill a deep-water well at Egypt's North El Arish block to the east; Mubadala has acquired a 20% share in ENI's 45% stake in the Nour offshore concession in Egypt, marking its second acquisition in the country. BP has acquired the remining 25%; ENI has agreed to develop a gas pipeline in southern Algeria, to link its two producing oilfields in the Berkine basin, Lajmat Bir Roud and Menzel Lejmat, and enable a surplus of 7 Mcm/d of production; Petrofac has won a $1 B EPC contract to develop Algeria's Ain Tsila gas field and will produce gas at a rate of 364 Mscf/d by 2023.

No Change ⇔ ● Very Positive
Deterioration in the last month ⇩ ● Positive
Improvement in the last month ⇧ ● Negative
● Very Negative

ABOUT US

Qamar Energy provides leading-edge strategy, commercial and economic consulting across the energy spectrum to governments, international oil companies (IOCs), national oil companies (NOCs), investors, and oil traders.

ROBIN MILLS • CEO

Robin is an expert on Middle East energy strategy and economics, described by Foreign Policy as "one of the energy world's great minds". He is the author of two books, *The Myth of the Oil Crisis* and *Capturing Carbon*, columnist on energy and environmental issues for Bloomberg and The National, and comments widely on energy issues in the media, including the Financial Times, Foreign Policy, Atlantic, CNN, BBC, Sky News and others. He is a Senior Fellow with the Iraq Energy Institute, and a non-resident fellow at the Columbia Center for Global Energy Policy. He holds a first-class degree in Geology from the University of Cambridge, and speaks five languages including Farsi and Arabic.

RECENT APPEARANCES & TALKS

Seminar for International Power Company, Jan 2019 • *Presentation on Changing Energy Dynamics in Emerging Markets*

S&P Global Platts

Platts' Middle East Executive Petroleum Conference • *Panel discussion on* ***Evolving Middle East Trade Flows Now & in the Future***

EU Delegation

EU Delegation Trade Counsellor Seminar • *Presentation on* ***MENA Energy Landscape***

QAMAR NEWSLETTER ARCHIVES

February 2018 • March 2018 • April 2018 • May 2018 • June 2018 • July 2018 • August 2018 • October 2018 • November 2018 • December 2018 • February 2019

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