

THE QAMAR NEWSLETTER

Issue 32, June '19



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The sunny and windy Wadi Rum, Jordan. By 2021 the country is aiming to have 50% of its power generated by wind or solar energy. 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).

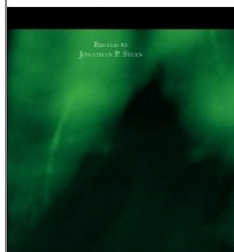
The QAMAR NEWSLETTER is a monthly publication that provides critical appraisal and focussed assessments of the month's energy developments across the MENA region.

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THE FUTURE OF GAS
IN THE GULF:
CONTINUITY
AND CHANGE



APPETITE AND INNOVATION: NATURAL GAS IN THE UAE

Robin Mills • Exclusive Chapter for the Oxford Institute of Energy Studies' *The Future of Gas in the Gulf: Continuity and Change*

Robin provides an update on the natural gas developments of the UAE in OIES's latest book, *The Future of Gas in the Gulf: Continuity and Change* in an exclusive chapter which includes in-depth coverage and analysis of the UAE's ambitious natural gas drive, and what it means for the regional and international gas markets.

Also read *RISING FROM THE ASHES: NATURAL GAS IN IRAQ*, an exclusive chapter authored by Luay al-Khateeb, Iraq's Minister for Electricity, and edited by Robin Mills for the book.

To purchase the book, follow this link.

HOW COUNTRIES CAN LEARN FROM JORDAN'S RENEWABLE ENERGY PIVOT

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



On the road from Wadi Rum to Petra in Jordan, where signs point to the Sheikh Zayed solar complex, wind turbines turn languidly in a steady breeze. At Petra, even Bedouin encampments have solar panels and many homes in Amman use solar tubes to heat water. The UAE made headlines with its world-record solar installations, but in all the Middle East, the impact of the renewable revolution is most visible in the Jordanian landscape. By last year, the Hashemite kingdom had installed 285 megawatts of wind and 771MW of solar power, a significant chunk of its total generation of about 4 gigawatts. By 2021, it wants to have 2.7GW of renewable capacity.

Over the next decade, Jordan's efforts could really take off – providing half of all electricity output, in our analysis at Qamar Energy. It is only a small market, but it is an important trailblazer for the region's aspirations in renewables.

Jordan's success has been built on good resources, solid policy and the imperatives of an energy crisis. Like most Middle East

countries, the kingdom has abundant sunny desert land and, similar to Egypt and northern Saudi Arabia, it's also quite windy in places.

The country started early on encouraging renewables with the Tafila wind farm, a joint venture with Masdar, built in 2015. It offers investors a reasonable return, and gives smaller users such as hospitals and universities the chance to build solar panels on vacant land and transmit the power through a grid.

The biggest impetus to alternative energy was the cut-off from Egyptian gas supplies following the 2011 revolution, because of repeated militant attacks on the Sinai pipeline. Jordan's budget deficit widened because the country, which imports more than 90 per cent of its energy needs and has historically financed its deficits through grants and soft loans, had to burn expensive oil for electricity. Jordan, which already hosted thousands of Iraqi refugees, had to accommodate an increasing power demand due

to an influx of 1.3 million Syrians escaping the conflict in their country.

In response, the kingdom opened a liquefied natural gas import terminal at Aqaba, and negotiated supplies from the American company Noble, which produces from offshore Israel. Jordan has large resources of oil shale, effectively an immature form of petroleum source rocks, which can be cooked into oil. A Chinese-led consortium is developing a power plant based on burning this dirty material. Efforts to construct a nuclear power plant have been hampered by a lack of cooling water, public opposition and the high costs of financing. Instead, Amman may opt for smaller, modular nuclear reactors that could be fabricated off-site.

To cover the higher costs of fuel, energy subsidies had to be cut back, putting a heavy burden on citizens at a time of sharp economic slowdown. But this had the positive effect of making individual rooftop solar installations attractive for small businesses and householders.

Local Jordanian companies, such as Kawar Energy and Shamsuna Power, along with Dubai-based companies including Yellow Door Energy, have created viable businesses and high-skilled employment. By the early 2020s, Jordan will have the Middle East's lowest carbon output electricity grid, despite the carbon-heavy oil shale facility.

Success will soon bring its own challenges. Renewable output will exceed total demand at times, while the country still needs to provide for high-consumption and night-time periods. Hydropower, which could be used to store excess renewables, is minimal in the desert country.

The Red-Dead Sea project is intended to bring water to the Dead Sea, which is fast drying up due to climate change and the overuse of the Jordan River. On the way, the water would generate power for desalination. But the expensive venture faces environmental concerns and political hurdles in co-operating with Israel.

Philadelphia Solar, a local company, has announced plans for a solar plant with battery storage. Concentrated solar thermal plants (CSP), like the one under construction in Dubai, can save the Sun's heat to generate power overnight. These do not seem to be part of Jordan's plans yet, but the country has excellent conditions for CSP.

Electricity interconnections with Egypt, Saudi Arabia, Iraq and the West Bank are also under way, which could boost the resilience and renewable share of the whole area's power grid. It could also send power to help rebuild war-torn Syria. Jordan's consumers will have to consider the benefits from the country's renewable expansion, particularly industries which have complained of high electricity prices. Prices are high during peak demand hours, but this scheme will have to become more flexible to lower prices when there is an excess of solar.

Jordan's small market and head start in renewable energy means it will reach these hurdles to solar deployment probably before any other country in the region. Its success in devising policies to continue attracting capital, boosting its renewable generation, local employment and electricity exports, while reducing consumer bills, will be an important signal for its neighbours. This is particularly true for countries in the Arabian Gulf – whose utility companies are thinking about how to overcome similar

barriers to their bold renewable plans. Such complementary resources and opportunities open the space for co-operation between these two regional allies.

HOW A CONFLICT WITH IRAN WILL PLAY OUT FOR OIL

Robin Mills • *A version of this article appeared in The National, Jun. 23, '19*

After tankers, the theatre of US-Iran confrontation shifted to the skies, with the downing of an American drone, and to Basra, with rocket attacks on an ExxonMobil camp. Talk swirled of planned US strikes against Iranian military sites, then called off, and of cautions to the Iranians conveyed through Oman. Where could things go from here, and what does that mean for oil markets? There are at least five outcomes along a continuum.

A deal, even a retouched version of US President Barack Obama's Joint Comprehensive Plan of Action, or an accord of little practical impact, would allow President Donald Trump to claim victory as he has done with North Korean nukes and Mexican trade. Sanctions on Iran would be eased in return for its continuing compliance with the limits on its nuclear programme and perhaps some vague concessions on missiles and regional destabilisation.

Iranian oil exports would recover, putting 1-1.5 million barrels per day of oil back on the market, which would cause a sharp drop in prices. The OPEC+ group would have to accommodate this, requiring Saudi Arabia and its Arabian Gulf allies to bear most of the burden. If they did not cut back substantially, prices would fall back to the \$40 per barrel range.

In the second case, both sides could tacitly step back from the brink, which would require the US to issue waivers for purchases of Iranian oil, abandoning its "zero exports" target, and drop plans to block petrochemical exports. Iranian exports hovering around 1 million barrels per day, as in the Obama-era sanctions, would mildly depress prices, as when unexpected waivers late last year took Brent crude below \$55 per barrel.

In the third case, today's state would continue: Iran under increasingly strict sanctions, and retaliating with a series of relatively small and mostly deniable attacks, on shipping, strikes against infrastructure, continuing to fire on US drones, and encouraging proxy allies to make pinprick attacks on American targets and oil sites in Iraq. The leaks of a planned US attack could themselves be intended as a warning to Tehran not to escalate further.

The two tanker strikes in the Gulf of Oman have already caused Lloyd's of London insurance to declare the area a war risk zone. Ships entering this area would pay about an extra \$180,000 in insurance, or 10 cents per barrel for a very large crude carrier, not a negligible figure. Countries using the Gulf, excluding Iran itself, would lose \$500 million per year in the extra insurance on their crude exports alone.

Of course, this is more than offset by the \$2.40 per barrel (3.9 per cent) rise in prices on the news of the drone's shooting down. A continuation of attacks could embed a small risk premium in the oil price but is overshadowed by gloomy trade news. At some point, the main customers for Gulf oil and gas would feel the

need to protect their lifeline. Trump has tweeted often enough that the US is not any more dependent on the region's crude.

India has deployed two ships in the Gulf of Oman, the Chennai and Sunayna, to protect its merchant vessels. At some point, China, which has a naval base at Djibouti, and Japan could join them. Russia would also see an opportunity to insert itself into the Gulf, as it has done other crises in Syria, Libya and Venezuela.

A multinational marine patrol would win back some of the support lost by the Trump administration's erratic Middle East policy. That could contain the immediate problem. But the involvement of other leading powers, with conflicting interests, would render the situation more intractable and, in the long term, more dangerous. The US navy would be tied up escorting ships which would remain vulnerable, sapping its ability to act in other areas such as the South China Sea.

Fourthly, in response to some further provocation from Tehran, the US could begin the strikes apparently called off on Thursday. Then Iran would itself likely retaliate further with more attacks on tankers, Iraqi facilities or elsewhere. The threat to petroleum supplies alone, and building of stocks by wary consumers, would probably add several dollars more to the price. Probably actual production or exports would not be seriously disrupted. Bypass pipelines and strategic storage would cover for a few days of precautionary shutdowns or rerouting of ships.

The fourth situation could quickly escalate into the fifth: a large-scale American military assault on Iranian assets across the region, met by an unconstrained response from Tehran. Iranian exports would halt entirely, and as with Iraq after the first Gulf War, might not rebound significantly for years. Shipping through the Gulf could be temporarily interrupted, affecting not only oil but also liquified natural gas (LNG), petrochemicals, aluminium and other commodities. Depending on their location, LNG buyers would scramble for oil or Russian gas as a replacement.

Red Sea traffic would also be harassed, though less seriously. Iranian power generation could be disrupted and electricity and gas exports to Turkey and Iraq shut down, meaning another hot and angry summer in Basra. Transit through the Strait of Hormuz would be restored quickly, but a large part of Iraq's almost 5 million barrels per day oil output could be put offline, and the chaos would risk an Isis resurgence. In this scenario, oil prices may briefly touch \$100, falling back but remaining elevated by a permanent loss of Iranian and Iraqi supply. But as with the 2003 invasion of Iraq, incalculable ramifications would be set in train across the region.

WHY OIL MARKETS ARE ON A KNIFE EDGE OVER REGIONAL TENSIONS

Robin Mills • *A version of this article appeared in The National, Jun. 16, '19*

It goes beyond megaphone diplomacy – more like Friedrich Nietzsche's "philosophising with a hammer". Japanese Prime Minister Shinzo Abe's overtures in Tehran were brusquely rejected on Wednesday, and two tankers in the Gulf of Oman were attacked on Thursday. If the oil market's tepid response encourages complacency from the US or aggression from Iran, it could spark a much more serious conflagration. US Secretary of State Mike Pompeo unequivocally blamed Tehran for the attacks.

Discrepancies between the tanker owner's statement and the American account, the history of the Iraq invasion and the administration's casual relationship with facts, will make it harder to convince bystanders or sceptics. Nevertheless, with due caution, it is likely Iran was responsible for the attacks and that the orders came from the top. The two sophisticated, near-simultaneous and widely-spaced attacks don't look like an accident, or someone exceeding their authority.

One ship was carrying naphtha, a light oil derivative, and the other had methanol, a flammable chemical. This choice of targets could be deliberate, avoiding a major crude oil spill, which prevailing winds would drive on to the shores of Iran and the eastern UAE. Such a pattern of calibrated escalation, sending an unmistakable message short of overt hostilities, was established by the damage to four tankers off Fujairah in May.

Current events have been compared to the "Tanker War" in the 1980s, the later part of the Iran-Iraq war. The geopolitical and military context is very different, as the current incidents are at a much lower level, and not part of a declared open conflict. Tactics and vulnerabilities have also evolved significantly since then. But there are similarities in the oil market context. Despite the loss of much of Iranian and Iraqi supply, the 1980s were glutted by a surge of non-OPEC output. Saudi Arabia had ramped up its production in 1986, causing a price crash, in frustration at its OPEC partners' lack of discipline, before shaky co-operation was restored. Despite 451 attacks on ships by both Iran and Iraq, oil traffic continued, protected from 1987 by US escorts.

Now, despite the coherence of the OPEC+ alliance, prices have been soft this year, and the International Energy Agency is predicting record non-OPEC production gains next year. When markets have previously been on a knife-edge, as in 2008, Middle East tensions were supposed to be adding \$10 per barrel to prices. Thursday's attacks caused a modest 4 per cent rise.

The traders' calculus is difficult. The slowing world economy and threats to trade dent demand. Global inventories have been rising despite OPEC's long-running attempts to bring them down, but some of this may be precautionary stocking against interruptions. Spare production capacity is ample to cover disruptions from Iran, Venezuela or other places, but most is held in Saudi Arabia and its Gulf allies, so they would be vulnerable to shipping interruptions.

The multiple places targeted – Fujairah, the Gulf of Oman, Saudi Arabia's Red Sea pipeline and, last July, two Saudi tankers in the Bab El Mandeb – do not include the most-watched Strait of Hormuz. Low-tech Somali pirates caused havoc off the Horn of Africa around 2007-11, until international navies stepped up their presence. It would be hard for US warships to protect tankers in the vast expanse of the Gulf of Oman from small limpet mines, detonated after a long interval, or drone attacks.

Iraq tries to remain friendly with Iran while not angering the US, recently securing crucial waivers on imports of gas and electricity from its neighbours. If Tehran really wanted to shake the world oil market, this is the easiest place for them to do so. Iraq's vital exports, almost 4 million barrels per day, the second-largest in OPEC, come from creaking offshore terminals, where sabotage might look like a technical breakdown.

The limited price action so far may be frustrating for Iran. Its ability to profit from higher prices is greatly reduced by the

collapse in its exports under US sanctions. Waiting for a Democrat in the White House in 2021 is risky – Donald Trump may win again, or a replacement might not re-join the nuclear deal. So Iran could have hoped to send a signal that further escalation in the Gulf would cause an oil crisis that would bode ill for the incumbent's hopes of re-election next year. That is harder when the market remains soft.

Assuming it is indeed behind the incidents so far, Tehran could move to more aggressive levels, betting on Mr Trump's unwillingness to be sucked into another war in the Middle East, and planning on de-escalating with negotiations. Something like that may have worked for North Korea's Kim Jong-un, but would be very risky. Some US officials casually see military action against Iran as a re-run of 1988's Operation Praying Mantis, a retaliation against Iranian forces attacking Gulf tankers, or as the Reagan administration did Muammar Gaddafi's Libya in the 1980s, an ultimately inconsequential troublemaker that needed an occasional swat. Yet, runaway escalation could have all kinds of unplanned consequences, such as opening the door for Russia in the Gulf, or unleashing chaos from which Tehran could forge strategic victory from military defeat. The energy market may be right to be sanguine for now, but dangers lie a few steps ahead.

SHAREHOLDERS WANT IOCS TO SHOW THEY CARE ABOUT CLIMATE CHANGE

Robin Mills • *A version of this article appeared in The National, May 27, '19*

In April, Extinction Rebellion activists glued themselves to the entrance of Shell's offices in London. Last Monday, Greenpeace installed heavy boxes in front of the doors to BP's premises, preventing staff from getting to work. But perhaps the most important environmental examination came from investors at the annual general meetings of the two companies last week. National oil companies (NOCs) may be relieved they do not face similar pressure – but it will come, and they need to be prepared for it.

The campaigners want the oil companies to shut down or convert their businesses entirely to renewable energy. Shell in particular is no stranger to such action; there was Brent Spar controversy in 1995, when Greenpeace challenged its disposal plans of an old oil platform. But the objections have centred ever more on climate and there are demands for a rapid move to a carbon-neutral future. Some of the questions at the companies' meetings were by environmental activists, who had bought a few shares to gain the right to speak. But most were by major investors who have either committed to making their businesses compatible with climate targets or are at least concerned about the long-term viability of oil majors' business models in a future of tightening carbon constraints. Such investors might represent \$23 trillion (Dh84tn) of capital worldwide, according to a BlackRock report.

While BP has committed to reduce its emissions, a shareholder resolution to set targets for greenhouse gases from its products by the end users was defeated. Shell has committed to track these emissions too. The American companies are lagging badly, but Occidental, the most climate progressive, announced last

week plans for a massive plant to suck carbon dioxide directly from the air and use it to extract oil. Activist investors and environmental campaigners have so far barely challenged NOCs. A rare exception, in 2013, when a Greenpeace ship challenged drilling by Russia's state companies Rosneft and Gazprom in the Arctic, was met by the arrest and harsh treatment of 30 protesters, who were eventually released.

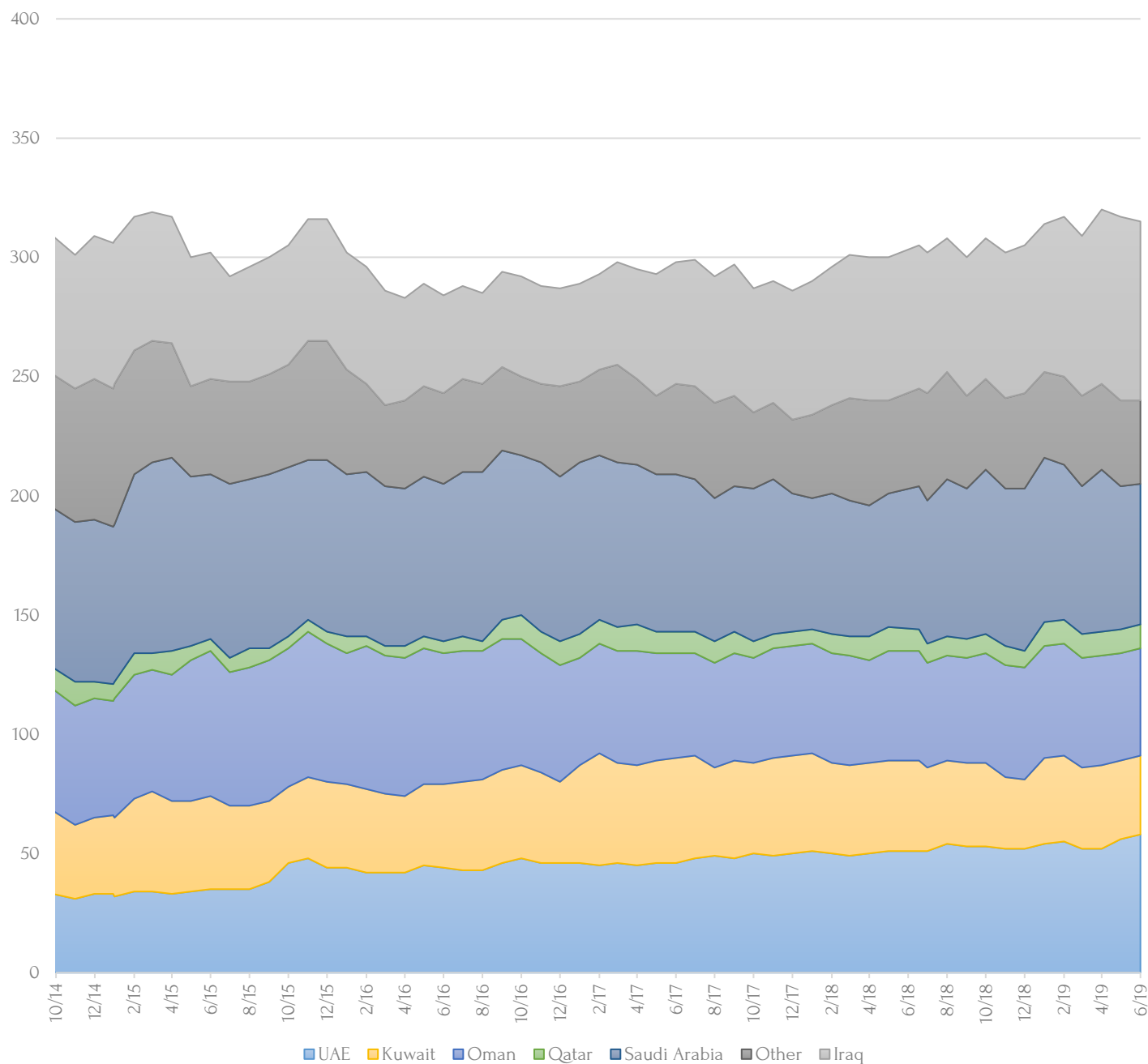
Some NOCs, such as the Russians, Norway's Equinor, Brazil's Petrobras, and international subsidiaries of the Chinese majors, have minority listings with non-state shareholders. But most NOCs, such as Petronas of Malaysia, Pemex of Mexico or Sonatrach of Algeria, are entirely state-held. For their host governments, NOCs are the main custodian and operator of national resource wealth, which won't be cast aside lightly. They consider their low-cost oil and gas resources will continue in production even if extraction is forced to cease elsewhere. So, NOCs may feel they face little public pressure to have answers on climate or plans for reducing their carbon footprint. But this would be a mistake, for the reasons of capital, personnel, projects and markets.

Even if they do not have public shareholders, NOCs are increasingly raising capital through bonds and through private investments. Financiers are also facing growing scrutiny on their climate footprint. For employees, whether expatriates or citizens, younger people in particular are concerned about the environment, and tend to see the petroleum business as a sunset industry that will not assure a lifetime career. The boom and bust of oil prices and cycles of layoffs does not help either.

NOCs are venturing ever more beyond their home bases, particularly "downstream" – oil storage, refining, petrochemicals and fuel retail. Such project investments will be increasingly challenged by activists and host communities, unless their promoters are known to be responsible about climate change. NOCs' main customers are increasingly not the mature markets of Europe, Japan and North America, but fast-growing economies in Asia, the Middle East and one day, Africa. Even if these countries are less environmentally conscious than Europe today, they are on the front line of climate emergency. Wildfires, heatwaves, droughts and floods can rapidly change minds.

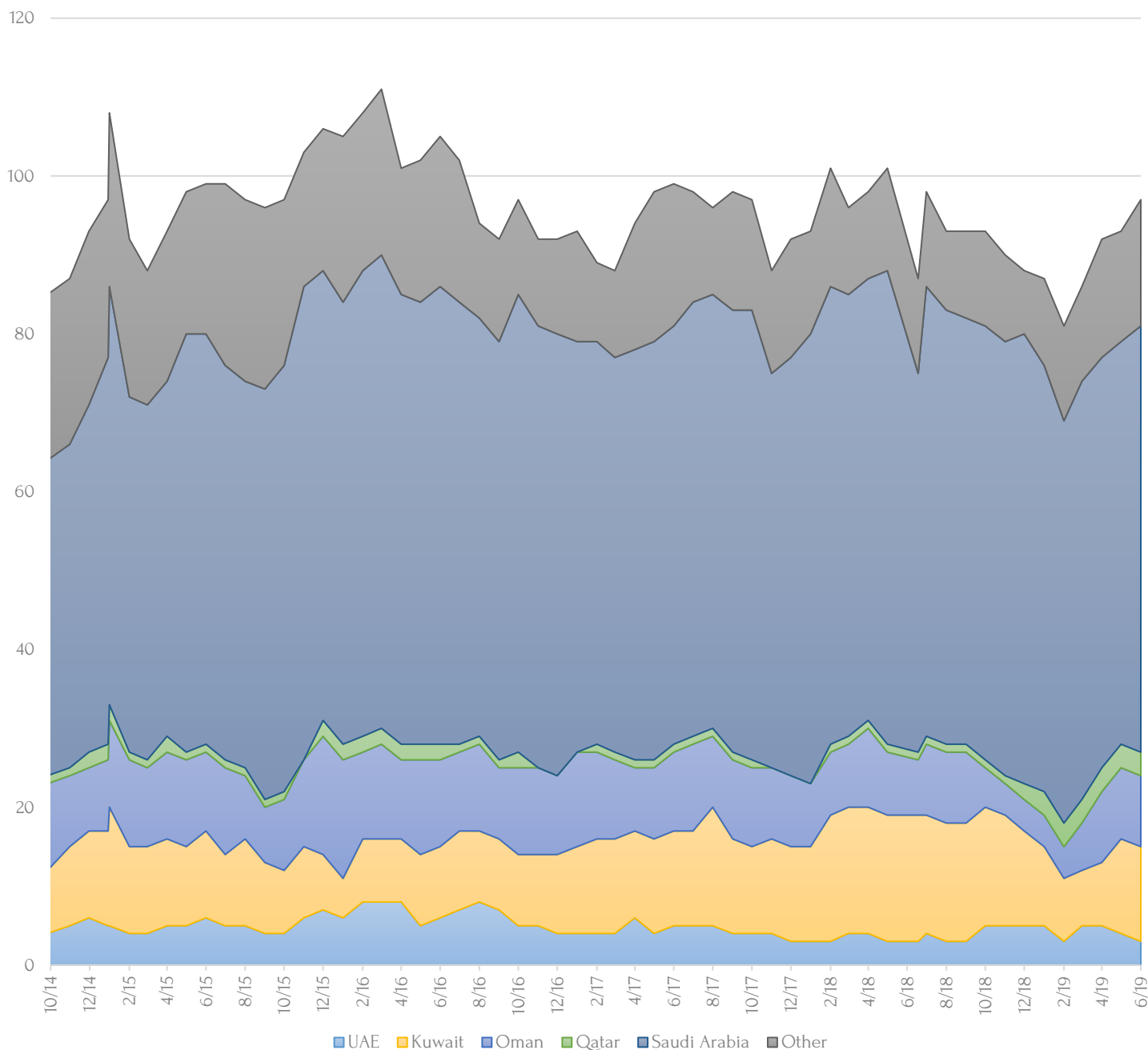
When NOCs diversify into areas such as petrochemicals, imports into other countries may face stricter restrictions or tariffs when their carbon footprint is deemed too high. The UK has recently announced plans to ban single-use plastic products such as straws. What the NOCs should do, though, is a difficult question. They can boost energy efficiency, stop flaring and clean up methane leaks, but these are the bare minimum. They can progressively shift from oil to gas, as the European supermajors are already doing. But gas, though cleaner, is still carbon-based. Shell, BP or Total can venture, as they already are, into solar power, offshore wind, electric vehicle charging, biofuels, batteries and other low-carbon options. The NOCs can do this too, but can never become pure renewable or electricity companies: their *raison d'être* is their control of the world's largest and cheapest hydrocarbon resources. They need feasible environmentally-friendly ways to use hydrocarbons – and a viable story for financiers, campaigners and the general public – which must be a topic for future articles.

RIG COUNT SNAPSHOT: OIL



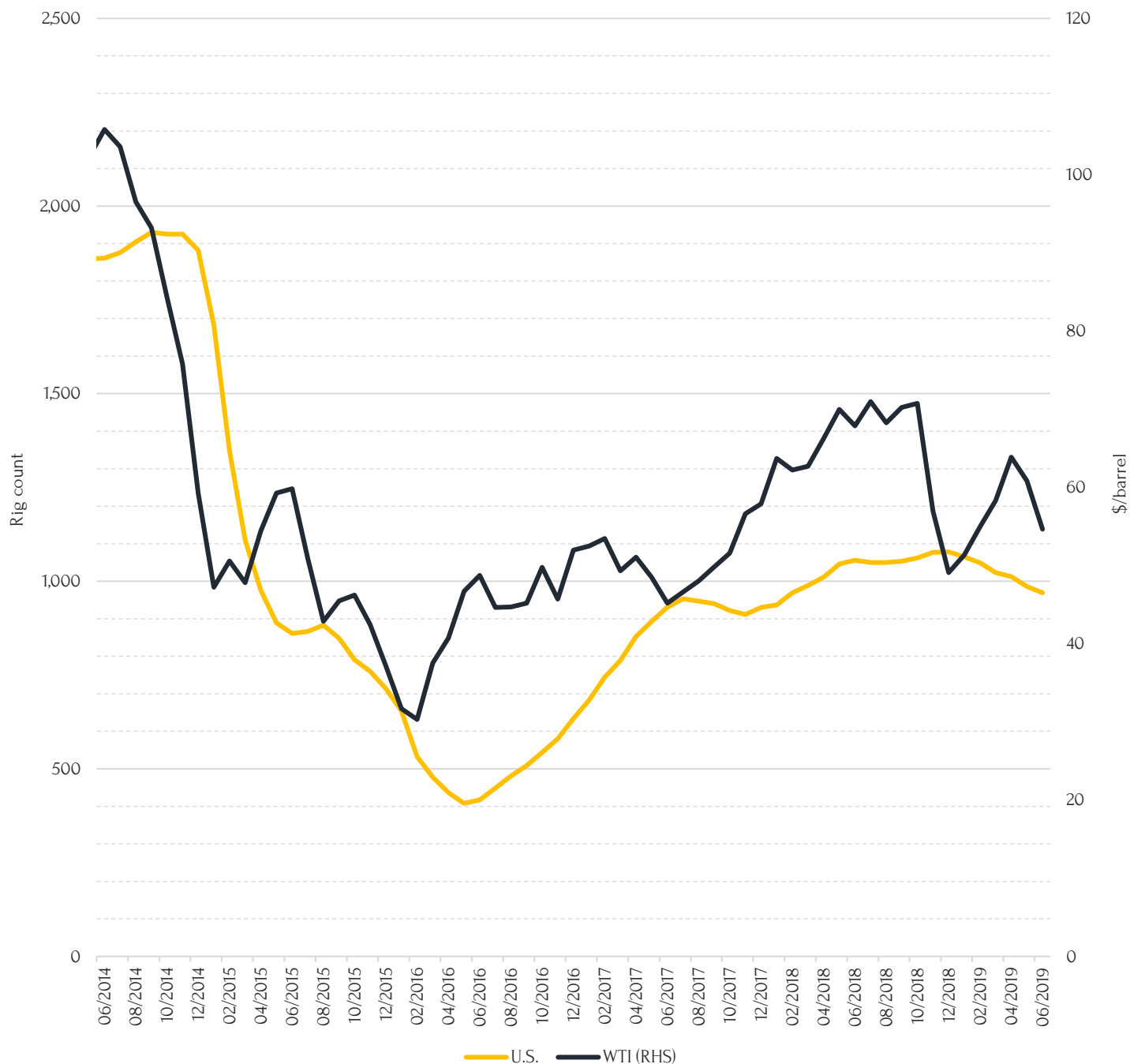
- The Middle East's overall oil rig count in June fell by -2 excluding Iran.
- Iran's rig count is not included by Baker Hughes; OPEC estimates total (oil and gas) rig count in Iran at 157 in 2018, remaining the same till June 2019, which is doubtful, due to falling production and deteriorating exports in the face of sanctions.
- Iraq's rig count touched 75 in June, after increasing to 77 in April, the highest since April 2014, which has cast doubt over its OPEC compliance. Production from state-operated fields Majnoon, Luhais, Tuba, Ratawi, and Nahr bin Omar has been cut back by >300 kbpd, but internationally-operated fields continue to make gains.
- The UAE's rig count reached an all-time high in June at 58, exceeding May's record of 56, following the start of operations at the 40 kbpd, Al Dhafra Petroleum-operated Haliba oilfield on the southeast border of Abu Dhabi.
- Kuwait's rig count has stayed steady at 35 throughout H1 2019, ~11% lower than its H1 2018 average as it maintains strong compliance with the OPEC cuts (averaging 120% since January 2019).
- Saudi Arabia's rig count gained +3 in June, even though production (9.81 Mbpd) remained well within its OPEC quota (10.3 Mbpd).

RIG COUNT SNAPSHOT: GAS



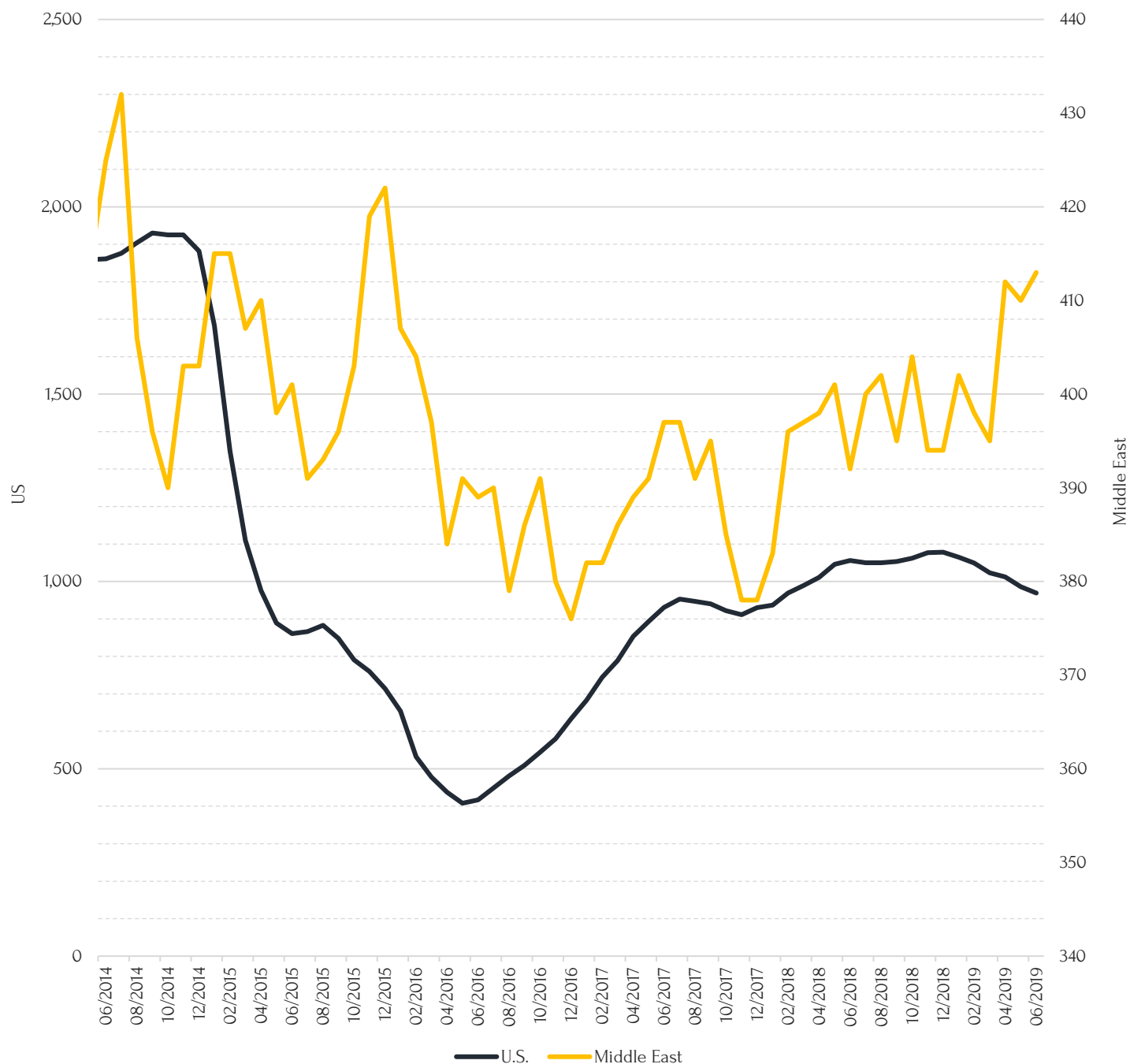
- The Middle East's overall gas rig count gained +4 in June, still a drop of -16 from its year high count of 101 in May 2018. The region reached a high of 123 gas rigs in January 2014, but has since declined, averaging 99 in the last four years. We could see this trend reverse as major gas expansion plans get underway in the UAE, Saudi Arabia, Oman and Qatar.
- Oman's rig count gained by +3 in Q2 2019 (from Q1 2019), -1 rig 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 early in January.
- Kuwait's rig count increased by 38% in Q2 2019 (from Q1 2019), still -3 less than its 2018 average, 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 from 2023-24 onwards, and will contribute to increasing Kuwait's output to 3.5 Bcf/d by 2031-32.
- The UAE's rig count witnessed no change from its Q1 2019 average, remaining steady at 4. We expect rig count to increase as large sour gas projects pick up momentum, exploration begins on the first bid round blocks, and ADNOC awards exploration licenses from the second competitive bid round launched in May. First awards are expected in Q1 2020.
- Saudi Arabia's rig count gained by +3, -2 lower than its 2018 average of 56, as it seeks to expand gas production. On July 09, Aramco awarded \$18 B worth of contracts to increase the Marjan and Berri fields' oil and gas production capacities by 550 kbpd and 2.5 Bcf/d respectively.

RIGS VERSUS OIL PRICES: US RIGS & WTI



- US rig count fell by -17 in June and a y-o-y drop of 8.3% from June 2018 (-87 rigs).
- The major fall in rig count is at the Permian Basin, where rigs have fallen by -10 over the last 3 months. This is indicative of producers trimming spending plans due to rising debts and pressure for shareholder returns, even though oil prices have now more or less stabilised. 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 higher productivity per rig and fracking crew, but also the need for higher prices to encourage more capital investment.
- The EIA expects US crude production to average 12.36 Mbpd in 2019, up from an estimated 10.96 Mbpd in 2018.

RIG COUNT: US & MIDDLE EAST



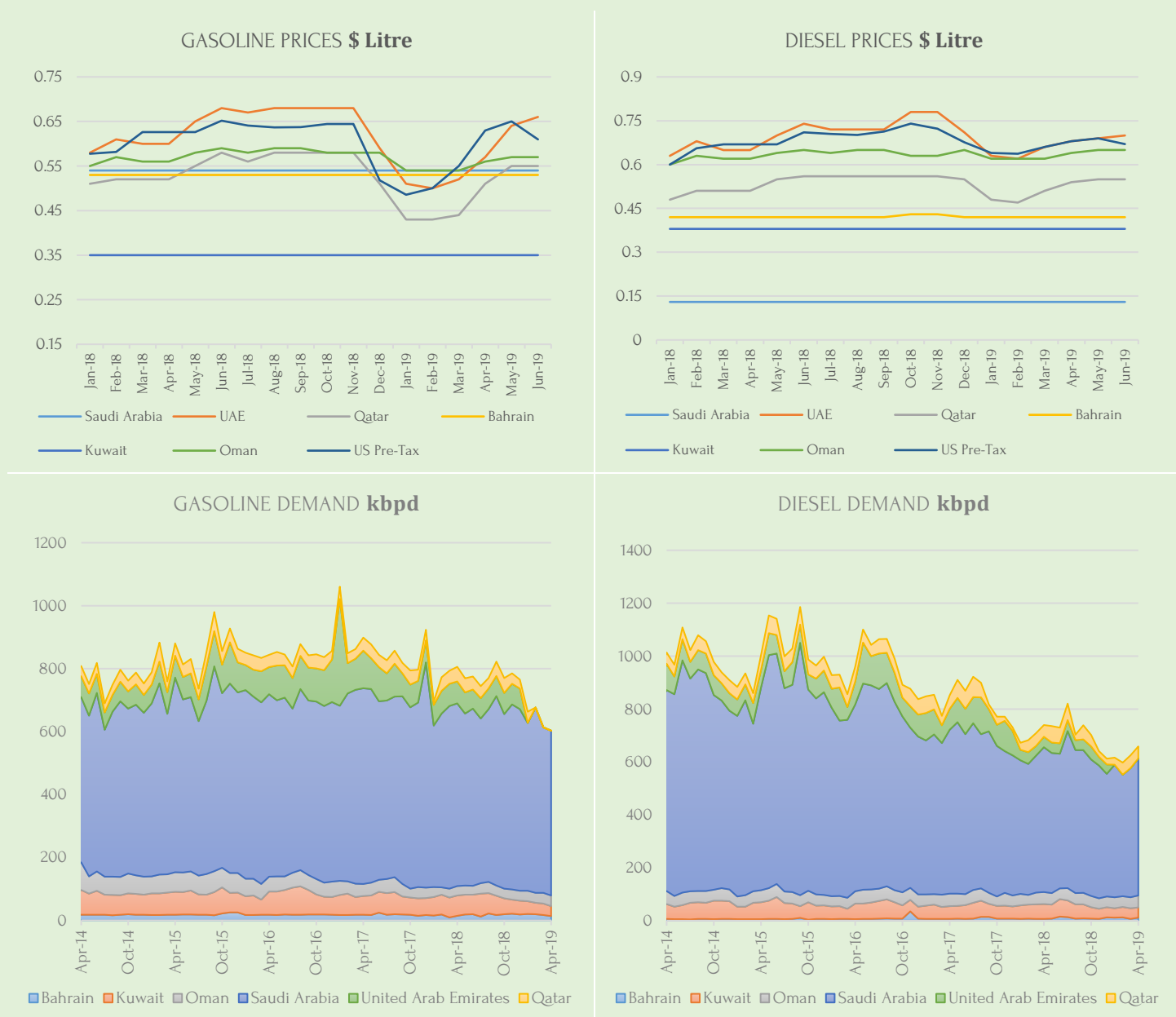
- The US' offshore rig count gained +2 in June and +7 y-o-y from June 2018, even though Hurricane Florence had raised concerns of a similar fall in rig count as was observed during Hurricane Harvey and other natural disasters. Onshore rigs are expected to fall by >100 rigs y-o-y from July 2018 in July, indicating a slowing down of spending plans by independent shale producers.
- Total Middle East rig count gained +9 from its 2018 average of 396 rigs to 405 rigs in June, as Saudi Arabia increased production to meet rising domestic power demand in the summer months.

FUEL PRICES & SUBSIDY REFORMS

JUNE 2019

- After easing in Q1 2019, gasoline and diesel prices in the UAE were increased for the fourth consecutive month in line with rising global prices in June, by 3.5% and 1.2% from May respectively.
- In Qatar, prices for gasoline and diesel, which rose by 2% and 9% respectively at the start of Q2 2019, witnessed no change in June from May's levels. Prices however remain below November 2018's levels, the highest recorded in 2018.
- Similarly in Oman, the price of M95 and diesel, which increased by 3.2% and 2.5% in May, had no change in June.
- 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'. Its gasoline prices remain the lowest in the GCC.
- 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 June 2019 in the GCC countries.



Note: JODI UAE gasoline and diesel and Qatar gasoline figures are unavailable for 2019.

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

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- 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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MAXIMISING REVENUE

INCREASING SUPPLY NETWORK AGILITY

DEBOTTLENECKING SHORTCOMINGS

WE TARGET

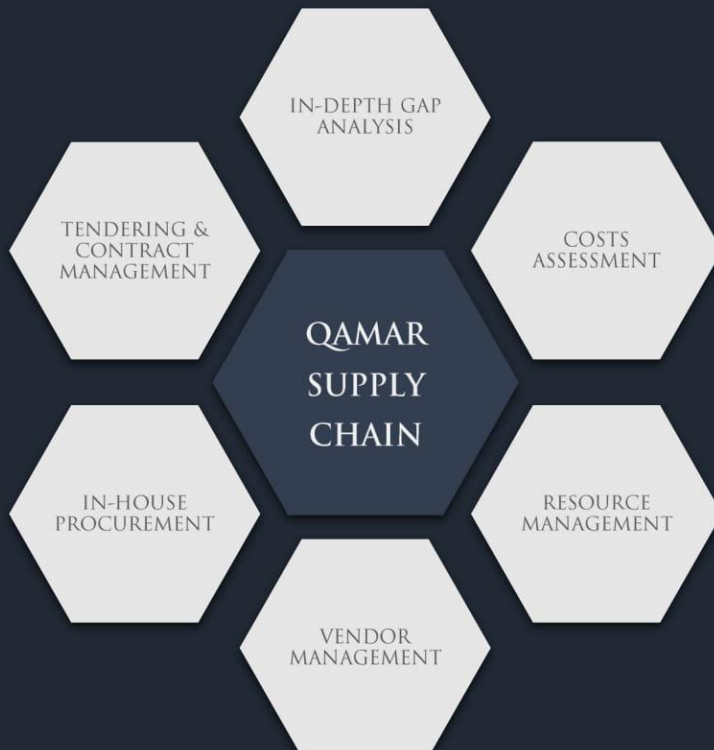
ENERGY MAJORS
OIL & ENERGY TRADERS
INTERNATIONAL OIL COMPANIES
NATIONAL OIL COMPANIES
UPSTREAM FIRMS
DOWNSTREAM FIRMS

WHY US?

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



OUR SERVICES



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.



ORGANISATION OF PETROLEUM EXPORTING COUNTRIES OUTLOOK: SNAPSHOT

Roa Ibrahim • Consultant

- OPEC+ agreed to extend the cuts by 9-months into Q1 2020 based on the volumes previously agreed to (cut of 1.2 Mb/d).** The extension to 2020 suggests an outlook of weaker prices given uncertainty over oil demand into next year, due to a combination of slowing global economic growth, mainly in China, and rising US shale oil output.
 - US oil output was expected to grow by 1.8 Mbpd in 2019, outpacing demand growth according to IEA. OPEC sees a slightly higher growth rate of 1.9 Mbpd.
 - The IEA reduced its 2019 oil demand forecast to 1.1 Mbpd from 1.2 Mbpd in June, matched with OPEC July's monthly report. Both organizations see stronger oil demand in the second half of the year from improved economic conditions and seasonal winter demand.
- 2020 oil demand outlook also remains uncertain.** For 2020, the pace of growth will average 1.4 Mbpd in 2020 according to IEA, while OPEC sees a gloomier outlook of 1.1 Mbpd next year. OPEC anticipated demand for its crude to fall in 2020 to 29.3 Mbpd, compared to 30.6 Mbpd in 2019.
 - According to OPEC's July report, US oil output is expected to grow by 1.7 Mbpd in 2020, slightly lower than the growth rate for 2019, citing "...many uncertainties, including oil prices, investment discipline, hedging, cost inflation, unplanned outages related to technical issues, delayed start-ups and maintenance duration."
 - However, US oil output increases for 2020 are still higher than projected world demand growth.
- In general, the major OPEC producers try to refrain from setting an acceptable Brent oil price in the media.** Yet the Iraqi Oil Minister, Thamer Ghadhban, noted that the general view is that \$70/bbl or higher was acceptable.
 - The market has been fairly unimpressed by the extension of the cuts. Price rose to just above \$65/bbl on July 1st. This is partly over concerns the cuts will not be fully adhered to; and partly over continuing demand downgrades and expectations of strong US growth.
 - Many OPEC members such as Algeria and other smaller members are struggling economically and are in no position to cut production further. Iraq is also planning production increases from IOC-operated fields and is not meeting its pledged cuts. The only oil producers likely to keep high voluntary compliance are the Gulf Arab states, while Non-OPEC's cooperation is dependent on Russia, and natural declines.

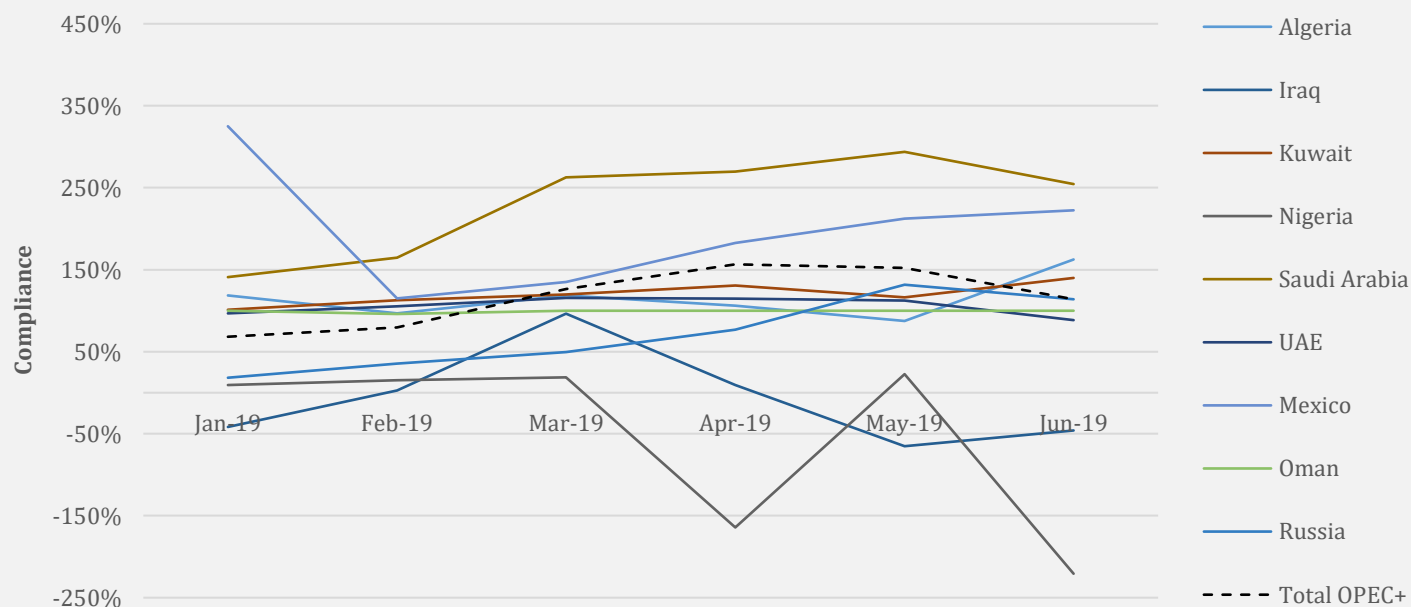


Figure 1 OPEC+ Compliance for Selected Producers in 2019¹

¹ OPEC monthly reports

OPEC WATCH

AVERAGE CRUDE PRODUCTION FOR JUNE 2019

29.83 Mbpd

- 68 kbpd

From May 2019



Non-OPEC Oil Supply*

68.73 Mbpd

- 540 kbpd

from May '19

*including OPEC NGLs



**Non-OPEC
Crude Output**

United States

Brazil

Kazakhstan



OPEC+ COMPLIANCE

- Overall OPEC compliance was at 122% for June, with the largest cuts coming from Saudi Arabia (255%) and Kuwait (140%) among key producing countries.
- Russian production increased by 41 kbpd from May's levels of 11.44 Mbpd, but was still over-complying at 114%. In January, Russian compliance was at 18% and was gradually increasing month-by-month but the reduction in output was precipitated by the contaminated crude crisis that also crippled exports in May.
- Nigeria's undercompliance continued in June, with production increasing by 130 kbpd from May's levels of 1.73 Mbpd. Ongoing protests in Abuja, and rising output from the 200 kbpd Egina oilfield resulted in a -221% compliance for June.
- Oman maintained perfect compliance in June, the fourth highest after Saudi Arabia, Kuwait, and Bahrain (120%) amongst the GCC, producing 978 kbpd as per its allotted OPEC quota based on October 2018's production.
- The UAE had the lowest compliance among the big Gulf-3 producers at 89%, raising output by 11 kbpd from its allotted OPEC quota (3.072 Mbpd).

NEXT OPEC MEETING: December 2019

177th (Ordinary) OPEC Meeting in Vienna, Austria

LATEST ORGANISATIONAL CHANGES

- At the 176th Ordinary OPEC meeting in July, OPEC+ members pledged to extend December 2018's production cut of 1.2 Mbpd for another 9 months.
- The agreement is slated to stay in force till March 2020, and a decision on its extension will be discussed at the 177th Ordinary OPEC meeting in December 2019.
- On July 02, OPEC agreed to formally recognise its relationship with its OPEC+ allies through a "Charter of Cooperation". Moscow shows no interest in formally joining OPEC, but will remain in talks for a formal agreement with the cartel to keep oil prices balanced.

OPEC PRODUCTION

- Libyan production fell by 58 kbpd in June, owing to routine power cuts at its eastern fields. However, overall output for 2019 has remained above 1 Mbpd, signalling a return to stability, even though political tensions continue.
- Iraq's output witnessed a decline of 27 kbpd from the previous month as the country battles to reach its 2019 targets while maintaining compliance with the OPEC cuts.
- Saudi production increased the most of all GCC OPEC members (by 126 kbpd) in June, but still remained ~500 kbpd less than its pledged output. Saudi has been making up for lower compliance from Iraq.
- Iran's output continues deteriorating, with June's output falling by 142 kbpd. Overall, the country has lost 1.59 Mbpd in production from its 2018 high of 3.818 Mbpd.
- Political instability, power cut, US sanctions and the threat of civil disturbances have all but eliminated chances of a revival in Venezuela's production, which is struggling to remain above 700 kbpd. June's production was 734 kbpd.

KEY MENA ENERGY SCORECARD

JUNE 2019

QATAR DEVELOPMENTS

On June 24, Qatar Petroleum signed an agreement with Chevron Phillips Chemical to build the Middle East's largest ethylene cracker (1.9 Mtpa) which will increase Qatar's polyethylene output capacity by 82%; On July 02, QP signed another agreement with CPC to build the \$8 B US Gulf Coast II Petrochemical Project along the US Gulf Coast which will include a 2 Mtpa ethylene cracker and two 1 Mtpa polyethylene units; QP has issued a tender invitation for the 4 LNG mega-trains of its NFE project to three EPC joint ventures: Chiyoda Corporation and Technip France; JGC Corporation and Hyundai Engineering and Construction; and Saipem, McDermott Middle East Inc. and CTCI Corporation; the 4 LNG mega-trains are part of Qatar's plans to expand LNG production from 77 Mtpa to 110 Mtpa by 2024.



MENA ENERGY PRICE REFORM

Abu Dhabi will offer industrial companies a reduction of 40% on electricity tariffs under its Ghadan-21 Programme to support the private sector in exchange for significant contributions to the economy; the scheme is dependent on companies improving energy efficient practices; the reduction follows the Federal Electricity & Water Authority's decision to slash tariffs by 40% for residents in Northern Emirates in January; On July 05, Egypt announced increases in fuel prices as a part of its \$12 B IMF loan: M92 and M95 gasoline saw a hike of ~18.5% and 16.1% and diesel and kerosene prices rose by 22.7%; Saudi Arabia has continued 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 fell by 3.5% in June, but nationwide oil sales remained close to record levels at 3.95 Mbpd, even though production has been slashed by 320 kbpd from Majnoon, Luhais, Tuba, Ratawi, and Nahr bin Omar as part of the OPEC pact; Baghdad signed an MoU with Honeywell for processing 300 Mscf/d of associated gas from Ratawi, Majnoon, Luhais, Subba, and West Qurna-2 as part of the Ratawi Gas Hub Project that is expected to reduce Iraq's flaring by 20%; ExxonMobil evacuated its staff from the 465 kbpd West Qurna-1 oilfield after Katyusha rockets hit its residential facilities on June 19; this was the second time XOM evacuated its staff, the first being in May when the US embassy evacuated its staff citing unspecified threats from Iran; operations remain unaffected and stable.



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 2018, which appears to be nearing completion; The UAE's Barakah plant now looks delayed to 2021 due to lack of operational readiness, namely inadequate training of operating staff. Overall completion of the plant's 4 units is now over 93% (Unit 1: 100%, Unit 2: 95%, Unit 3: 91%, Unit 4: 82%); 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
Improvement in the last month ↗ Negative
Very Negative

KEY MENA ENERGY SCORECARD

JUNE 2019

ENERGY INFRASTRUCTURE SECURITY

Rumours of a blockade at the Repsol-operated 340 kbpd El Sharara oilfield in Libya by the Fezzan Rage Movement have been dismissed as the country continues to pump over 1.1 Mbpd of oil; however grievances of marginalisation at the hands of the government continue in the southern regions; Protests in Basrah have once again picked up against corruption and lack of electricity and water in the hot summer months, but have not affected the country's oil production; Sudan's protests against a deteriorating economy that turned deadly have not affected its oil output of >70 kbpd, while negotiations between Sudan's military and the protest leaders have once again been postponed.



ABU DHABI DEVELOPMENTS

ADNOC's joint venture with KNOC, Al Dhafra Petroleum celebrated first oil from the Haliba oilfield located on the southeast border of Abu Dhabi on July 02; the field is expected to reach 40 kbpd by end-2019; Eni's Ghasha sour gas field 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; ADNOC is considering a regional oil price benchmark to increase competitiveness over global benchmarks; NPCC completes giant Umm Lulu process platform; ADNOC, OCI form fertilizer JV; ADNOC & Exxon are looking to invest up to \$8 B to raise production capacity in Upper Zakum to 1 Mbpd by 2024.



IRAN DEVELOPMENTS

Iran's June exports have fallen to <300 kbpd, down from 400-500 kbpd in May and will likely deteriorate further; On July 04, British royal marines stormed the Grace 1, a Panama-flagged Iranian vessel suspected of travelling to Syria in contravention of EU sanctions on the Syrian regime, exacerbating already tense relations between the EU and Iran over the latter's threats to exit the JCPOA; in retaliation, the IRGC seized a foreign oil tanker over smuggling suspicions, and a UK-flagged tanker before releasing both; Iran has refused CNPC's request for a 2-year suspension of the South Pars Phase-11 project; The IOOC has ordered two platforms for the offshore Hendijan field; the 1,000-ton Salman platform offshore Iran is nearing completion; Iran has offered increased nuclear inspections if the US lifts sanctions under a UNSC dispute resolution process.



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 2018; 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 are planned for later in July, but might once again be delayed due to disagreements.



No Change ↔ ● Very Positive
Deterioration in the last month ↓ ● Positive
Improvement in the last month ↑ ● Negative
● Very Negative

KEY MENA ENERGY SCORECARD

JUNE 2019

MENA RENEWABLE ENERGY

In May Iraq launched a 755 MW solar tender, the first in the country's history; Eni inaugurated the construction site for a 10 MW solar PV plant in Tunisia which was awarded following a public tender. Eni is also working on the construction of the 5 MW Adam photovoltaic field in Tataouine, expected to be completed this year; Saudi's REPDO is planning to tender 12 solar PV projects with a combined capacity of 3.1 GW in 2019 (of which 7 solar PV projects, with a capacity of 1.515 GW have pre-qualified 60 bidders under Phase-2 of the National Renewable Energy Programme) after revising the country's solar targets from 5.9 GW to 20 GW for 2023; The 1.18 GW Noor Solar Plant in Abu Dhabi has begun operations; Masdar has begun installing the first of 13 turbines in Dhofar, Oman which is the GCC's first and so far 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; Iran is planning to build a 1 GW solar park in the central province of Markaz by 2022 but delays are likely due to lack of access to finance; Kuwait has expanded its 2030 renewables target at the Shagaya Renewable Energy Complex to 4 GW (including 400 MW of CSP), after starting commercial operations at its 50 MW Shagaya CSP plant, marking the completion of phase 1 of the Shagaya Renewable Energy Park in February; Oman Power and Water Procurement Co. (OPWP) has invited proposals for developing the Manah Solar I IPP and Manah Solar II IPP (1.1 GW capacity combined) following the procurement of the 500 MW Ibri II solar PV plant in March.

MEDITERRANEAN GAS COMMERCIALISATION

ENI renewed its gas import agreement with Sonatrach and extended it to 2027; 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 to drill their first exploration well in Block 4 by end-2019, and first well in Block 9 by 2020; Lebanon's first LNG imports through its new FSRU contracts will begin in 2021, as any successful discoveries would not enter production before then; Lebanon has agreed to enter US-brokered talks with Israel over a disputed maritime border; 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 Idku export terminal restarts, backed by an average natural gas surplus of 1.56 Bcf/d; BP is set to boost production from the West Nile Delta to 700 Mcf/d under its second phase (Giza and Fayoum fields) of development; Dana Gas will drill a deep-water well at Egypt's North El Arish block to the east; 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; Turkey has ignored punitive EU measures to deter it from drilling for gas in the Cypriot EEZ, and has said it will continue drilling till the Greek Cypriot government accepts its proposal to cooperate; Only 2 consortia have bid in Israel's latest Bid Round-2 to explore 12 of the 19 offshore blocks on offer.



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

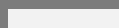
Robin is an expert on Middle East energy strategy and economics, described by Foreign Policy as "one of the energy world's great minds". He is the author of two books, *The Myth of the Oil Crisis* and *Capturing Carbon*, columnist on energy and environmental issues for Bloomberg and The National, and 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.



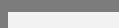
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