THE QAMAR NEWSLETTER

Issue 22, April ‘18

Saudi Arabia has announced its intentions of developing 200GW of solar capacity by 2030. Can it? Cover story by Robin Mills.

IN THIS ISSUE

INSIDE: MENA ENERGY REVIEW

Qamar Energy is a leading consultancy based in Dubai, which expedites understanding the energy dynamics of the Middle East and North Africa.

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

قمر
QAMAR ENERGY

GIANT SAUDI ARABIAN SOLAR PUSH MAY LEAD TO NEW MIDDLE EAST ENERGY ERA

Robin Mills • *A version of this article appeared in The National, April 08, '18* • **COVER STORY**

If we covered the entire land surface of the emirate of Dubai with solar panels, it would generate about 200 gigawatts – the same size as Saudi Arabia's planned solar power venture with Japan's SoftBank, announced at the end of March. This mindboggling scale – equivalent to two-thirds of all the existing solar worldwide - might make this gigaproject seem unrealistic. But even something a quarter the size would lead Middle East solar power into a new era.

The $200 billion non-binding agreement with SoftBank, signed during Crown Prince Mohammed bin Salman's US tour, builds on a much smaller October accord, part of the kingdom's Vision 2030 target for 9.5GW of solar power by 2023 (the country's current peak power demand is about 75GW). Now, the first phase of this giant scheme is intended to fulfil most of that target as early as next year.

Riyadh's previous ambitious solar programmes have led to very little result. So, although momentum has finally been picking up, there will be industry scepticism. Still, even if it leads to "only" a few tens of gigawatts installed over the next decade that would still be a major advance.

Taken literally, the implications of the full 200GW scheme are striking. It would require two years of the world's current manufacturing of solar panels. Saudi Arabia has just one large solar plant under construction, the 0.3GW Sakaka project, awarded to local firm ACWA Power in February at a cost of $302 million. It will take more than 600 Sakakas to make up the planned SoftBank scheme. The Saudi grid and its electricity market would need to be drastically upgraded to cope with such large and shifting amounts of variable power. And it also casts doubts on the plans for large amounts of nuclear power, discussions for which were also on the Crown Prince's agenda in the US.

Saudi Arabia's current peak power demand is likely to grow by 2030 to some 100GW-120GW, or more if efficiency measures do not take hold. Peak demand in summer is almost twice the winter's low, due to air-conditioning use, but of course solar generation is also higher in summer. The result is that the future Saudi Arabia with 200GW of solar capacity might have 80GW surplus in summer daytime hours, and almost as much in winter daytime. Solar power is cheap enough now that the country might afford to throw some of it away, but it would want to use as much as possible productively.

Masayoshi Son, the founder of SoftBank, has said the giant solar plant will have the "largest utility-scale battery" to provide evening power. It will have to have – even the US has only about 1GW of battery storage installed to date, although Bloomberg New Energy Finance predicts about 45GW will have been installed worldwide by 2024. At a rough estimate, and allowing for falls in battery costs, this might add another $150bn or more to the price-tag.

However, on an annual basis including night-time periods, and assuming all surplus electricity is stored for later use, the panels might generate about 70 per cent of the kingdom's total electricity demand, and save some $40bn of oil and gas fuel annually.

Saudi Arabia could also export some of the surplus. But it is surrounded by sunny desert countries with solar ambitions of their own. Political and commercial hurdles make the idea of long-distance cables to Europe, through some combination of Iraq, Turkey, Syria or Libya, look fanciful.

Of the neighbouring large markets, Egypt is building an interconnection with Saudi Arabia, and Cairo is more than an hour behind Riyadh, which could allow Egyptian solar power to contribute to the Saudis' evening demand. The GCC grid is seriously underutilised at present and does not have a commercial model for electricity trading.

The kingdom would really need a big consumer to its east to export its surplus afternoon power beyond the sunset. Iran is ruled out politically, so Riyadh would need to work with the UAE and/or Oman on links to the giant and growing electricity markets of south Asia. And this would require the tricky creation of a cooperative mind-set on a regional solar master plan, rather than competition.

Such a giant investment will, no doubt, also be intended to generate long-term value by creating a Saudi solar industry. This has to be done with care. It is unlikely that the kingdom can make cheaper solar panels than China's, and mandating use of its own will push up costs and risks. Insufficient local content was a reason given for rejecting Masdar's lower-priced bid in favour of ACWA's for Sakaka.

However, there are many other solar components for which Saudi Arabia could encourage local production. If this were on a GCC-wide basis, it would also build scale and bring down costs for the ambitious solar programmes in Dubai, Abu Dhabi and Kuwait.

For now, this immense scheme is still just a piece of paper. The obstacles it faces are not really technical and economic, but those of organisation, financing and future planning. If Saudi Arabia can progress even on a smaller part, it can lead the Middle East into the next phase of mass solar deployment and collaboration.

US APPROACH TO SANCTIONS PUTS OIL MARKET AT RISK

Robin Mills • *A version of this article appeared in The National, April 29, '18*

Although aluminium is used to make fighter planes and missiles, it has not generally been thought of as a strategic material.

But recent US sanctions have caused its price to rocket and then plummet. The metal's gyrations are a warning of what may happen as more states come into the firing line for oil sanctions.

The US put restrictions on Russia's Rusal, the world's second-biggest aluminium producer, preventing it from doing business in the US, to punish the country over its wars in Ukraine and Syria and subversion of western democracies.

The sanctions targeted Oleg Deripaska, a confidant of Russian President Vladimir Putin whose En+ Group owns 48% of Rusal. Viktor Vekselberg, another major Rusal owner, is also sanctioned; he was formerly a major shareholder in oil venture TNK-BP before it was sold to state giant Rosneft. Rosneft chief and Putin ally Igor Sechin has also been under interdict since 2014.

Aluminium prices rose 30 per cent over two weeks as customers scrambled to find alternative supplies. Miner Rio Tinto had the opposite problem, looking for an outlet for the raw material alumina it produces. European companies, users of aluminium such as car makers, have complained of damage from the Rusal affair.

The US then backtracked, giving the company more time to extract itself from its US operations, and prices fell back significantly, before jumping again as it appeared Mr Deripaska would stay at the helm.

This continuing saga teaches three lessons for the prospects of a much bigger and more volatile market: oil. The current White House is inclined to impose, modify and enforce sanctions abruptly and unpredictably, amplifying uncertainty and unintended consequences. The US is often not clear about precisely what its measures are trying to achieve: to send a signal; hurt an adversary; collapse a regime; or simply change its behaviour. At a time already of "trade war" fears, allies can be harmed and they then defend their own interests.

Three major oil producers are in the administration of US President Donald Trump's sights for sanctions: Russia again; Venezuela; and Iran. The political drivers in each case, the possible sanctions and their impact are different. But together they can add up to a serious shock to the market.

Some financing, investment and technology transfer to the Russian oil and gas industry is already forbidden. This will hit future production, but did not prevent the start of the Yamal liquefied natural gas project, which secured Chinese funding and partnership from French oil major Total. US senators and diplomats want to block the Nord Stream 2 pipeline, which they fear would deepen European dependence on Russian gas. But while some European countries agree, powerhouse Germany wants the project.

The US has made little secret that its "energy dominance" agenda includes profiting financially and geopolitically from selling more liquefied natural gas to Europe. Oily oligarchs in Mr Putin's inner circle might be targeted by further sanctions, but direct action against Russian oil exports is very unlikely.

Venezuelan production is already in free-fall, dropping 1 million barrels per day since early 2016. It is surprising it manages to export anything at all, with oilfield workers starving and stealing spare parts to survive but not allowed to resign, employees of foreign oil firms arrested for "treason" for refusing to sign corrupt contracts, three out of its four refineries shut down, and a shortage of cash to buy oil for blending with its heavy crude.

Sanctions could prevent Venezuelan oil exports to the US, which would be a big problem for American refineries that need heavy crude to balance their light domestic feedstock. Or they could ban insuring cargoes of the country's crude. Such measures would cause a collapse of the remaining economy, a messy default on debt, unpredictable political fallout in Caracas, and Russian and Chinese lenders picking over the carcass.

Iran is the most explosive of the geopolitical risks currently firing up the oil market. 2012-15's multilateral sanctions imposed under US President Obama cut its exports by 1.3 million barrels per day at the deepest point. French President Emmanuel Macron and German Chancellor Angela Merkel have sought to convince Mr Trump to stay in the nuclear deal negotiated by his predecessor, but he looks likely to refuse to reissue sanctions waivers on the May 12 deadline.

At this point, it remains entirely unclear what restrictions would be re-imposed, how vigorous and skilful enforcement would be, and how able foreign governments would be to protect their companies buying or investing in Iranian oil from extraterritorial sanctions. Some, perhaps many, oil traders would be warned off, but Chinese and Indian buyers and the grey market might pick up the spare barrels.

It is not clear what incentive Iran would have to renegotiate a deal with a party that has already reneged, nor that the US administration really knows the kind of “fix” it wants.

But a tightening oil market could be squeezed yet more by sanctions or total freefall in Venezuela combined with strong measures against Tehran. Other OPEC countries would undoubtedly be called on to put more oil on the market, risking the coherence of their pact with Russia to cut production.

With domestic petrol prices already rising, Mr Trump would have to choose between backtracking, escalating, or risking losses in November’s key Congressional elections. Oil is more combustible than aluminium, and the sanctions weapon, wielded haphazardly, can spark a conflagration.

OPEC’S BIG BARGAIN ON OUTPUT MAY BECOME VICTIM TO ITS OWN SUCCESS

Robin Mills • *A version of this article appeared in The National, April 22, ’18*

“In 1996, I thought $20 a barrel was reasonable; in 2006 I thought $27 a barrel was reasonable and now it is around $100 a barrel. I told them again it is reasonable," said former Saudi oil minister Ali Al Naimi in 2013.

The plunge the following year took prices all the way back to $27 by February 2016. Now, with Brent crude at $74 on Thursday, the leading oil exporters are again braking their oil output too hard.

US President Donald Trump responded to OPEC’s latest monitoring committee meeting in his usual style: “Looks like OPEC is at it again...Oil prices are artificially Very High!” he tweeted. Stories circulating beforehand suggested Saudi Arabia might be seeking prices of $80 or even $100 per barrel.

There are three problems with the OPEC/non-OPEC coalition’s current approach. Compliance is too high, and is not adjusted for some members’ inability to maintain production. The group’s metrics for assessing their deal, and hence their future guidance on policy, have become blurred. And current prices threaten demand growth, and hence risk a renewed slump.

The committee reported that OPEC and its non-OPEC partners had achieved record compliance to their planned cuts of 149 per cent – i.e., cutting 50 per cent more than they had planned. But this is not a sign of success. The group should be aiming to hit, not exceed, its target. The over-tightening is mainly due to the continuing collapse in Venezuela, whose output is down from 1.9 million barrels per day in 2017 to less than 1.5 million bpd in March. Angola has lost another 150,000 bpd over its target because of ageing fields. Meanwhile Saudi Arabia is also producing less than its target – when it should be slightly over-producing to compensate for others’ losses.

Having declared that they have pretty much achieved their goal of bringing down Organisation for Economic Co-operation and Development oil stocks to the five-year average level, OPEC has now begun casting around for a different metric to justify continuing cuts. This is not price: the Saudi Arabia and UAE energy ministers, Khalid Al Falih and Suhail Al Mazrouei, have resolutely refused to talk in terms of a specific price. Conversely, Iranian oil minister Bijan Zanganeh and Russia’s Alexander Novak, respectively, named $60 and $64 per barrel as “acceptable”.

Instead, Mr Al Falih has echoed the oil consumers’ organisation, the International Energy Agency (IEA), in pointing to the danger of a lack of investment. But this is not a guide to OPEC policy: what is the right level of investment? And with investments taking several years to come to fruition, this would not be helpful for making month-by-month production decisions. The focus on a lack of investment also contradicts OPEC’s actual policy. If there is a danger of shortages, the major producers should be investing heavily in extra production capacity, to capture market share at attractive prices. Instead, the theme of underinvestment reads more like a pre-emptive defence against tweeters such as Mr Trump.

Adjusted for inflation, the oil price has been above $74 per barrel for 13 out of the 47 years of the post-1970 era of OPEC power. Prices at today’s level are not unheard of, but they are unusual. The three main forecasting agencies - the IEA, the US' Energy Information Administration, and OPEC itself – all see production growth outside OPEC outstripping demand this year. After restoring its market share to a high in the third quarter of last year, OPEC has let it slip again this year – in an environment of strong prices and demand in which it should be gaining market share.

Mr Al Naimi was later to write that, however fair $100 per barrel had been, it had been a mistake. “It was very high,” he said in his 2016 autobiography. “That price unleashed a wave of investment around the world into what had previously been uneconomic oilfields.”

He is right, but more serious for the future is the loss of demand. Under the stress of high prices, world oil demand grew less than 1.1 million barrels per year on average during 2011-14. This improved to around 1.7 million barrels per day of annual gains in 2015-17. The hoped-for $80 per barrel price would represent a near-doubling from the middle of last year, and inevitably have a negative effect on consumption.

For the longer-term, an implicit price floor of $80 or $100 is a guarantee for high-cost oilfields and electric vehicles. Once battery cars enter the mainstream, consumer familiarity and economies of scale in manufacturing and recharging will impel them much faster than early adopters and government subsidies do today - a potentially devastating threat to all oil exporters.

From here, there are two likely paths. Either weakening demand, or a slowing economy and increased non-OPEC production will erode prices again, requiring the group to extend its cuts into next year. Or, prices could spike as the NOPEC coalition keeps too much oil off the market. This would worsen by the imposition of oil-related sanctions on one or more of Iran, Venezuela and

Russia. This would be followed by a steeper and longer price hole. It may already be too late, but for now the best the oil exporters can do is to ease off the brakes.

MIDDLE EAST NEEDS TO FOCUS ON DISCOVERING NEW HYDROCARBONS

Robin Mills • *A version of this article appeared in The National, April 15, '18*

As I argued last March, the Middle East needs to be more active in exploring for new hydrocarbon resources. ADNOC's offer last week of exploration blocks for direct bids is a first for the emirate. If the process is managed well, it will help refresh its petroleum sector, as well as setting the pace for other regional exploration.

There are four blocks on offer onshore, which wrap about the ADNOC Onshore area, and two offshore which lie to the west of the ADNOC Offshore fields. One of the onshore blocks covers Abu Dhabi city and the adjoining islands.

The company estimates the blocks hold billions of barrels of oil and trillions of cubic feet of gas, spread among existing undeveloped discoveries, and 110 prospects (well-characterised potential fields which require confirmation by drilling) and leads (which further work can mature into prospects).

It is not surprising that with some of the world's largest fields, such as Zakum, Bab and Bu Hasa, adjacent, that these areas are very promising. But still, new explorers will have to look for smaller structures as well as new geological concepts and subtler hydrocarbon traps, drilling deeper for gas, and examining unconventional reservoirs.

Competitive bidding is the right way to go, rather than bilateral negotiations. It should enable Abu Dhabi speedily to get the best deal for its resources, while still leaving companies an incentive to explore aggressively.

ADNOC has indicated it should be open to a wide range of companies willing to qualify. Supermajors with a long history in Abu Dhabi – ExxonMobil, Shell, BP and Total – know the geology well, but new entrant Eni has one of the best global recent exploration track records. Smaller firms, as long as they meet safety standards and are sufficiently financed, will bring new ideas and may explore fields too small for the super-majors.

The ADNOC offering has some question-marks. New gas would be very welcome to meet growing demand, particularly if it is sweet (not containing hydrogen sulphide, which is toxic and pushes up development costs). But how will possibly smaller or more marginal new oil fields be prioritised against expansion of existing giants, if by 2024 or so overall production is still constrained by OPEC limits? And will new entrants have ready access to ADNOCs existing infrastructure of pipes and processing plants?

The global oil industry's recent exploration record worldwide has been pretty dismal. Plenty of gas has been found, off Egypt, north-west Africa and east Africa. ExxonMobil has unearthed what looks like a major new oil province in deepwater Guyana in South America, and Statoil (soon to become Equinor) has made some impressive discoveries around Norway. Smaller, entrepreneurial companies such as Kosmos in Ghana, Mauritania and Senegal, Cairn in Senegal, and Tullow in various parts of Africa and Latin America, have had sterling successes.

But in the last few years, despite heavy investment, impressive technology and new geological concepts, finds of oil have been back to the level of 1940. Many smaller firms have over-hyped their prospects, making it impossible for the sector as a whole to raise finance. This has not yet mattered too much, because of the boom in unconventional oil which is easily found (if less easily produced). But more balance and scope of new resources is desirable.

The opening of Mexico, where large and mid-size international firms have bid aggressively and already made some promising discoveries, shows the appetite for high-quality acreage. And where better for fresh exploration than the leading Middle East oil producers, hardly touched over the past two decades outside a few spots such as Kurdistan, south-west Iran and Saudi Aramco's gas hunt.

ADNOC's offering is the most interesting but not the only recent regional exploration offering. Bahrain has made headlines with its offshore shale oil find, which will at some point open to international investors.

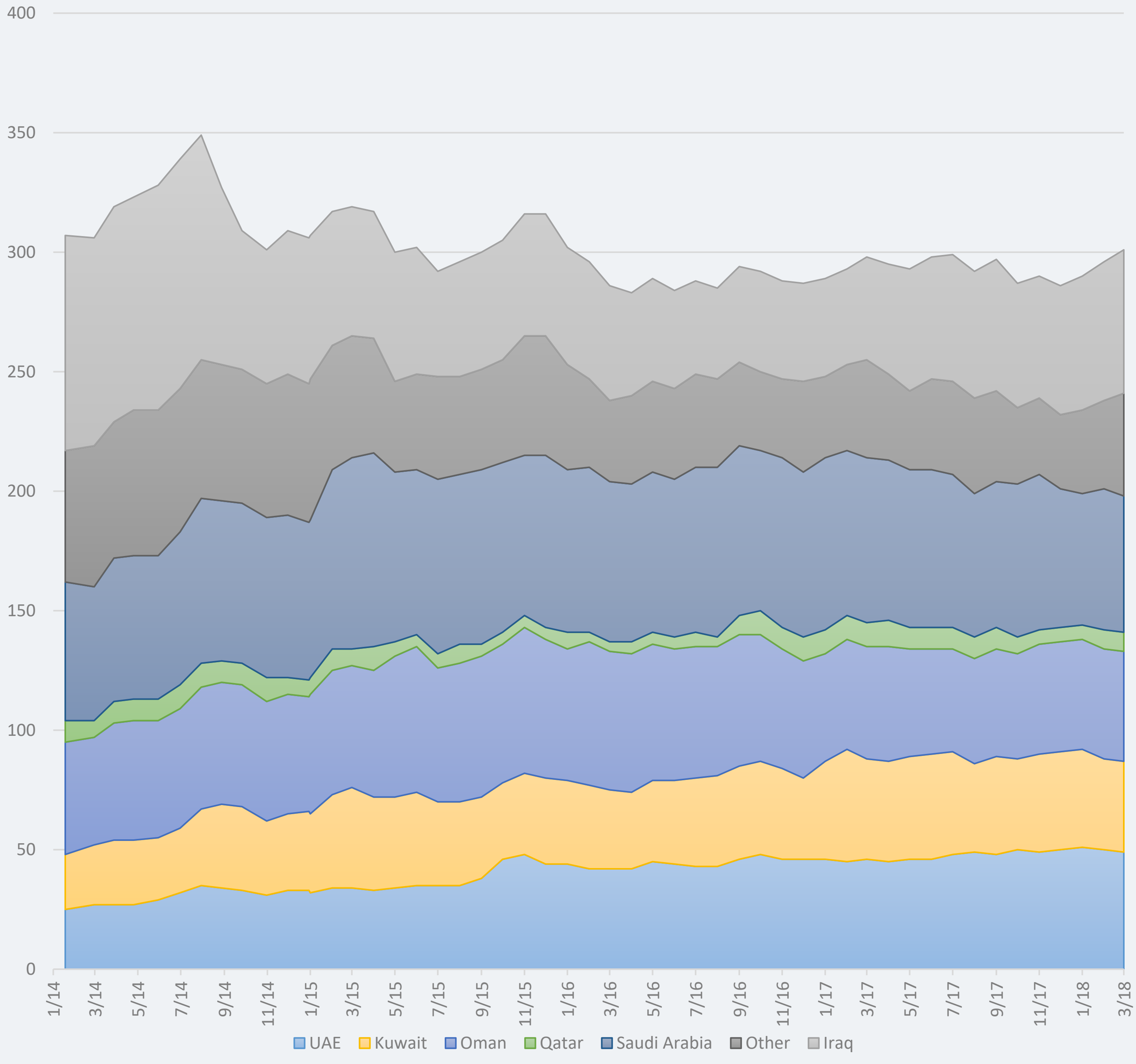
Iraq's fifth bidding round included 11 blocks along the Iranian and Kuwaiti borders, and awarded 6, though the ministry of oil caused consternation among potential bidders by bringing the date forward, giving very little time to analyse the new contract.

In the northern UAE, Ras Al Khaimah has historically produced modest amounts of oil and gas. Now, with supplies from the Omani exclave of Musandam drying up, the state firm RAK Gas has offered to explorers its entire territory, onshore and offshore, divided into seven blocks. It also has a new contract model, which it feels will be appealing. The geology is complex, and likely discoveries not giant, but RAK's industrial sector offers a ready market for gas.

Egypt has sought to build on the success of the giant deepwater Zohr gasfield by beginning initial surveys of its unexplored western Mediterranean and southern Red Sea waters. Oman, which has never found offshore oil or gas except in Musandam, now has a discovery near Masirah Island on its south-east coast. And Lebanon, hoping to join the east Mediterranean gas boom, has finally awarded three offshore blocks.

Some of these countries are looking to revitalise falling or small-scale production, or begin it for the first time. Others, Abu Dhabi and Iraq foremost, are taking the next step on a strong legacy. For all, matching attractive terms for investors to the quality of their geology is the key.

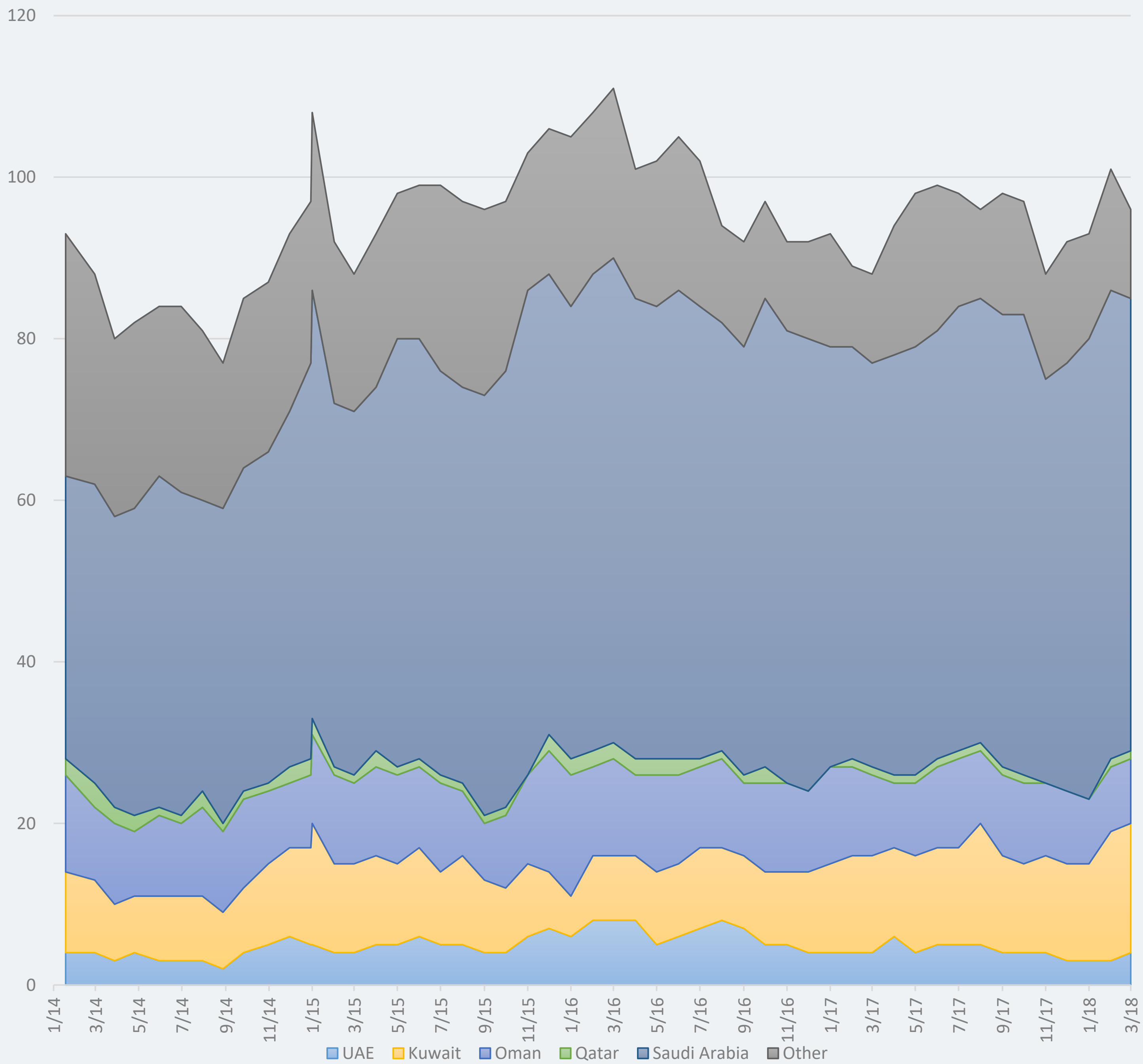
RIG COUNT SNAPSHOT: **OIL**



- The Middle East's oil rig count in March increased by +5, excluding Iran.
- Iran's rig count is not included in Baker Hughes; however, OPEC reports total (oil and gas) rig count in Iran has remained steady at 61 throughout 2017, till March 2018. Iran's production has consistently averaged ~3.813 Mbpd since January.
- The GCC's rig count fell by -3 in March, even as drilling remained steady at near-record levels.
- Iraq witnessed another increase of +2 in March as operations began at Avana Dome in Kirkuk. The field is currently producing between 38 and 55 kbpd, while its sister field, Bai Hassan, remains offline.
- Kuwait's rig count fell back to its October 2017 levels (38) once again, after having stayed steady at 41 since November 2017.
- Saudi Arabia's rig count and production fell by -2 and ~47 kbpd respectively in March, in the face of rising production from its global competitors (US averaged ~10.42 Mbpd in March, while Russia averaged 10.97 Mbpd).
- The Middle East's oil rig count averaged 293 in 2017, and has averaged 316 the last four years. The region's count has however stayed consistently under 300 over the last 24 months.

Source: Baker Hughes

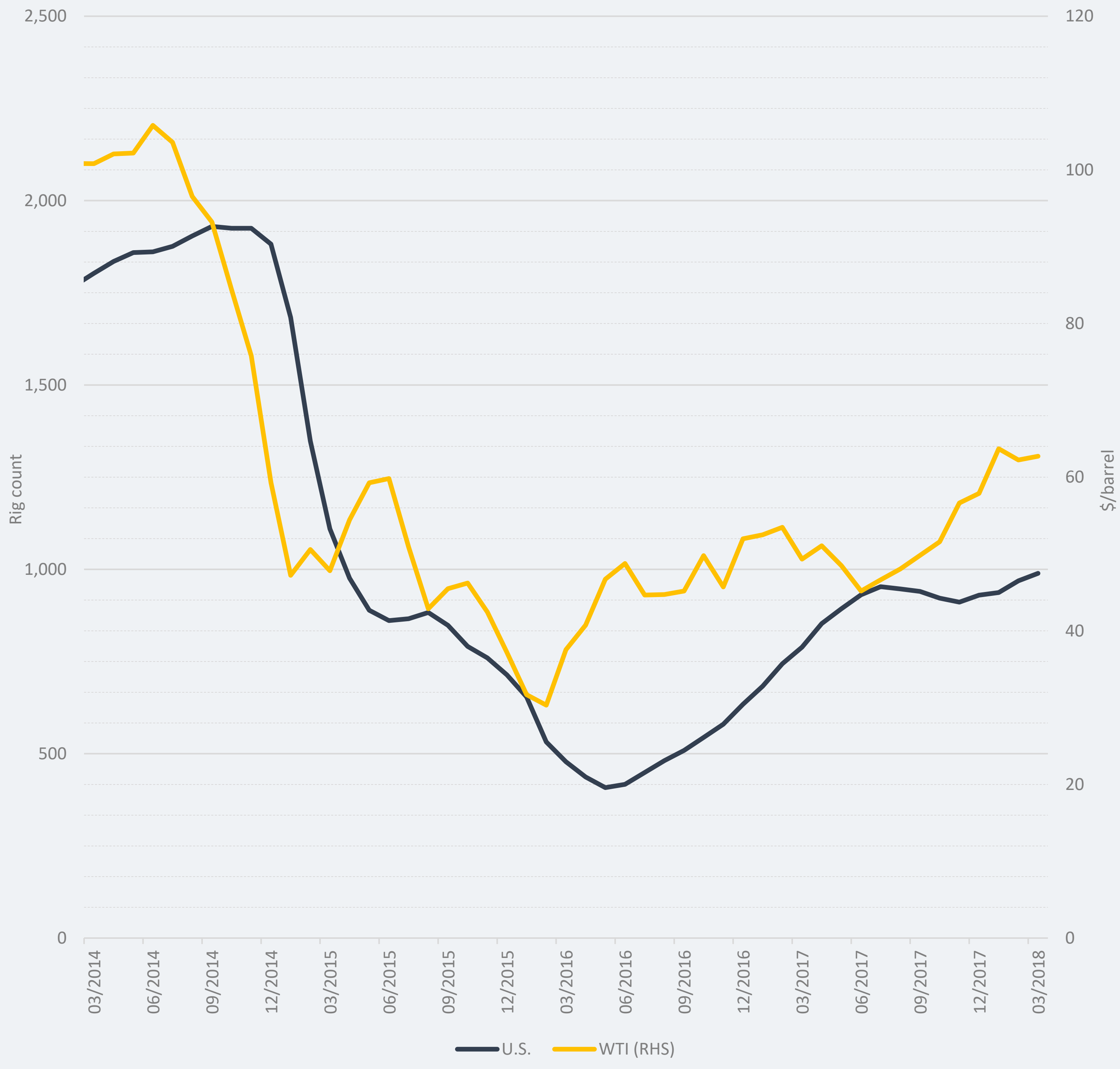
RIG COUNT SNAPSHOT: **GAS**



- The Middle East's gas rig count averaged 94 in 2017. Its highest level reached was in January 2014 at 123 gas rigs. While February saw a rise of +7, March saw a decline of -4.
- Qatar finally gained 1 in its gas rig count that had been at zero since November 2017, down from 1 rig in October with the North Field expansion ongoing.
- The UAE witnessed a rise of +1 in its rig count from December; on March 18 ADNOC awarded Total shares in two concessions in its offshore ultra-sour gas fields – Umm Shaif and Nasr, and Lower Zakum – to ramp up domestic production. The country has earmarked $109 B for acquiring downstream assets and sour gas development, indicating a future increase in rig counts.
- Kuwait gained by +4 in gas rigs from January, after having stayed steady since November 2017 with 12 gas rigs, beating its previous year-high count of 15 in August 2017. The Kuwait Oil Company plans to increase Jurassic gas production from 170 MMcf/d to 520 MMcf/d in 2018.
- Saudi Arabia continues to stay steady, averaging 53 rigs in 2017, gaining by +4 combined (January, February, March), due to higher production from Wasit, and plans to increase production from Midyan, Fadhil, and Turaif.

Source: Baker Hughes

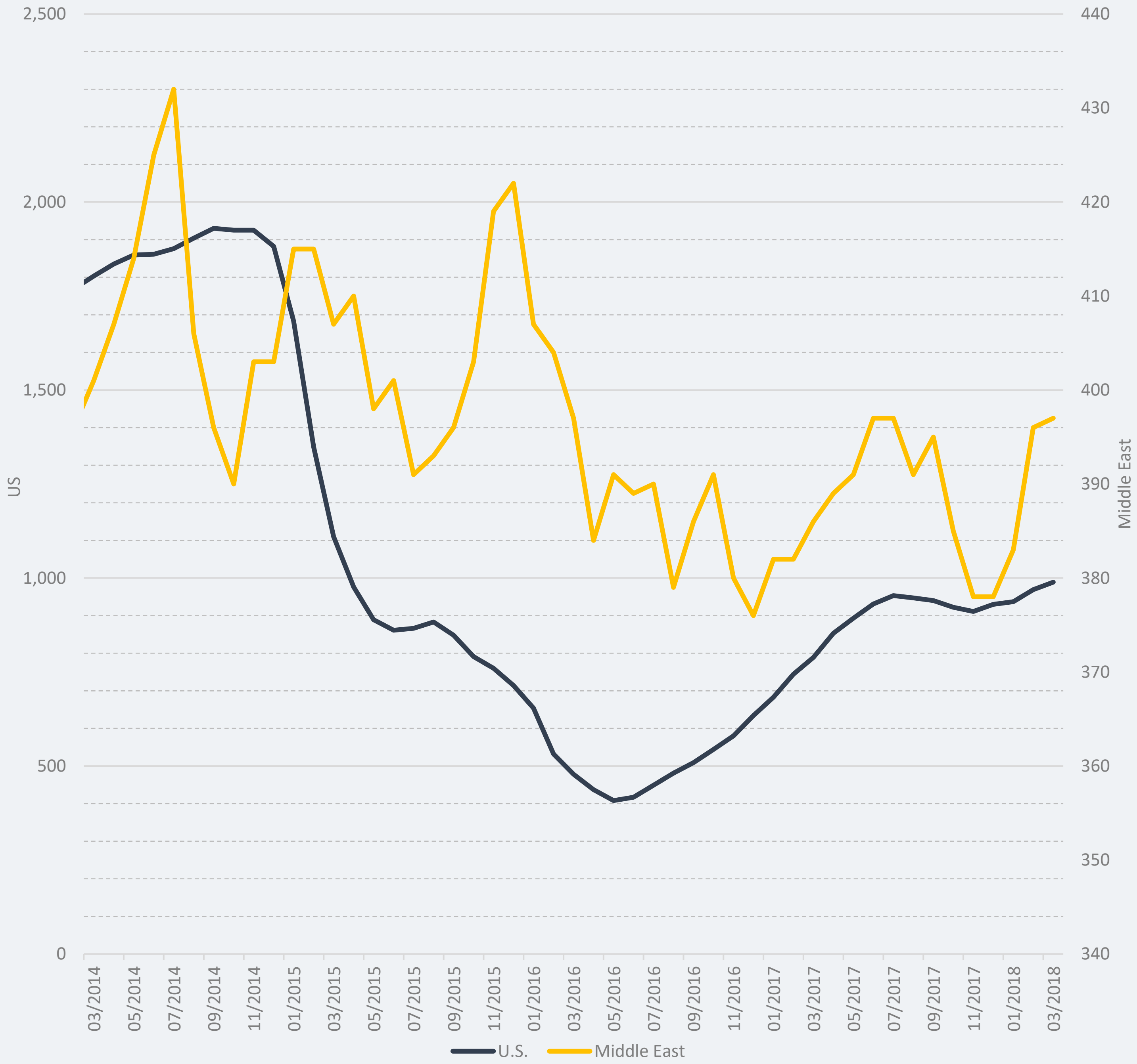
RIGS VERSUS OIL PRICES: US RIGS & WTI



- US rig count jumped by ~26%% in March y-o-y, a rise of 200 rigs. The US has overtaken Saudi Arabia in production, averaging ~10.42 Mbpd in March, about 510 kbpd higher than the kingdom's output for the same month.
- Total US rig count has been in decline since August of last year due to producers trimming spending plans citing softer oil prices; however, at 989 for March, an increase of +20 from February, the country has made a quick recovery, passing 2017's high of 953 rigs.

Source: Baker Hughes, EIA

RIG COUNT: US & MIDDLE EAST



- While the US witnessed a fall of -5 in its offshore count in 2017 owing mainly to Hurricane Harvey and other natural disasters, the country is making a recovery, having gained by +1 in its offshore rigs for March.
- Total Middle East's rig count stayed steady in March (a +1 rise from February, which gained by +13), as OPEC members continue to maintain relatively positive compliance rates; for example, UAE reached a compliance of 107% compliance in March, and Saudi Arabia at 126%.
- The region's rig count has averaged 392 for the last two years.

Source: Baker Hughes, EIA

FUEL PRICES & SUBSIDY REFORMS

APRIL 2018

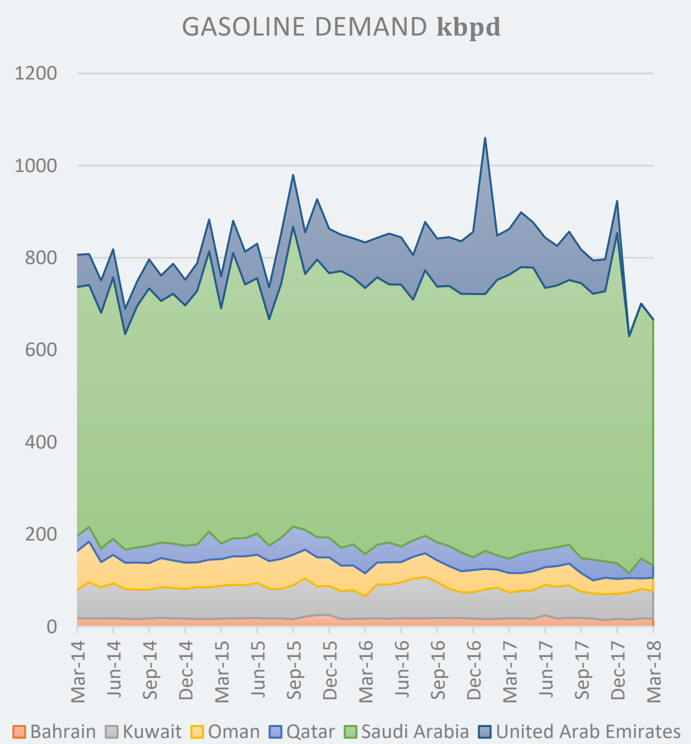
- The UAE was the first GCC country to remove fuel subsidies in August 2015; gasoline prices are to rise by ~6.8% combined in May from April. Fuel prices were announced to be revised upwards on April 30 in line with increasing world prices.
- In Qatar, diesel prices for May are to increase by ~9.9%, the highest ever since Qatar started pegging its fuel prices to the international market. In Saudi Arabia, gasoline prices have increased by 126% since 2018, and diesel by 14%.
- Meanwhile 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 merely a day after it was approved, finding the change 'too sudden', especially for citizens with a limited income.
- In Oman, the prices of Gasoline 91, 95, and diesel for May are to rise by ~3.42%, 2.80%, and ~3% respectively from April's fuel prices; demand for M-95 and diesel which gained by ~21% and ~22% respectively last month may decline in May.

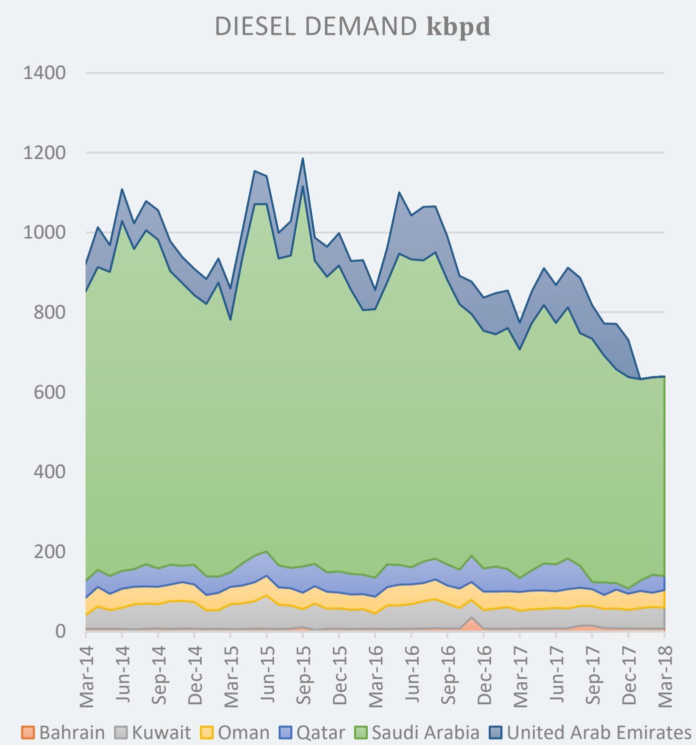
The following table represents the prices of gasoline 95 and diesel ($/litre) for April 2018 in the GCC countries.

GCC Country	PAST US $ PER LITRE		CURRENT US $ PER LITRE	
	Gasoline 95	Diesel	Gasoline 95	Diesel
Saudi Arabia	0.16	0.07	0.54	0.13
UAE	0.46	0.63	0.60	0.65
Qatar	0.27	0.27	0.52	0.51
Bahrain	0.27	0.42	0.53	0.42
Kuwait	0.21	0.36	0.35	0.38
Oman	0.46	0.39	0.56	0.62
US - PRE TAX	0.52	0.57	0.63*	0.67

*US Gasoline 95 values are calculated for Premium Grade.

Source: EIA, Qamar Energy





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

Source: EIA, Qamar Energy

LEADING ENERGY ECONOMICS AND RESEARCH CONSULTANCY QAMAR ENERGY AND STRATEGY FIRM LAVAUX GLOBAL FORM A GLOBAL ALLIANCE

Dubai | Perth, 23rd April 2018 – Qamar Energy and LAVAUX Global today announced the establishment of an alliance to redefine how global energy and resource companies combine energy economics, geopolitical analysis and market research in their strategic planning and organisation.

The alliance will leverage Qamar's unparalleled research, energy economics and advisory capabilities with LAVAUX's wealth of expertise in corporate strategy in the energy sector, operational excellence and organizational design. The alliance will support clients primarily in the Middle East, Australia and SE Asia.

Robin Mills, the CEO of Qamar Energy, said that "unprecedented geopolitical and technological changes face the energy industry from the Middle East through Asia. The Qamar-Lavaux alliance helps companies and governments to move beyond traditional advice, to translate an understanding of these transformations into effective strategies and robust, flexible organisations."

Dr Dorel Iosif, the Founding Partner and CEO of LAVAUX Global, said that "our alliance with Qamar Energy will offer our clients integrated market research, strategy and organisational effectiveness. Our assistance enables our clients to synthesise energy economics, energy policy and data analysis to drive the planning of solid and executable corporate strategy, business strategy, organisational effectiveness and innovation. The Qamar-Lavaux alliance bridges that gap with an integrated, seamless offering that is more efficient and cost-effective for our clients."

LAVAUX GLOBAL

LEADING ENERGY & ECONOMICS CONSULTANCY QAMAR ENERGY ENTERS NEW PARTNERSHIP WITH EGYPTIAN SUPPLY CHAIN MANAGEMENT FIRM CONPROC

Dubai | Cairo, 30th April 2018 – Qamar Energy and Cairo-based ConProc today announced the establishment of Qamar Supply Chain Consultancy, a new partnership that combines both companies' expertise in the management of procurement and sourcing in the Middle East's energy sector. This will drive efficiencies and added value, and ensure clients get the most benefit from their expenditure, ensuring a healthy and competitive regional industry.

Supported by Qamar's experience in energy economics, geopolitical analysis, and extensive global network, the consultancy will work with clients primarily in the Middle East and North Africa (MENA) region.

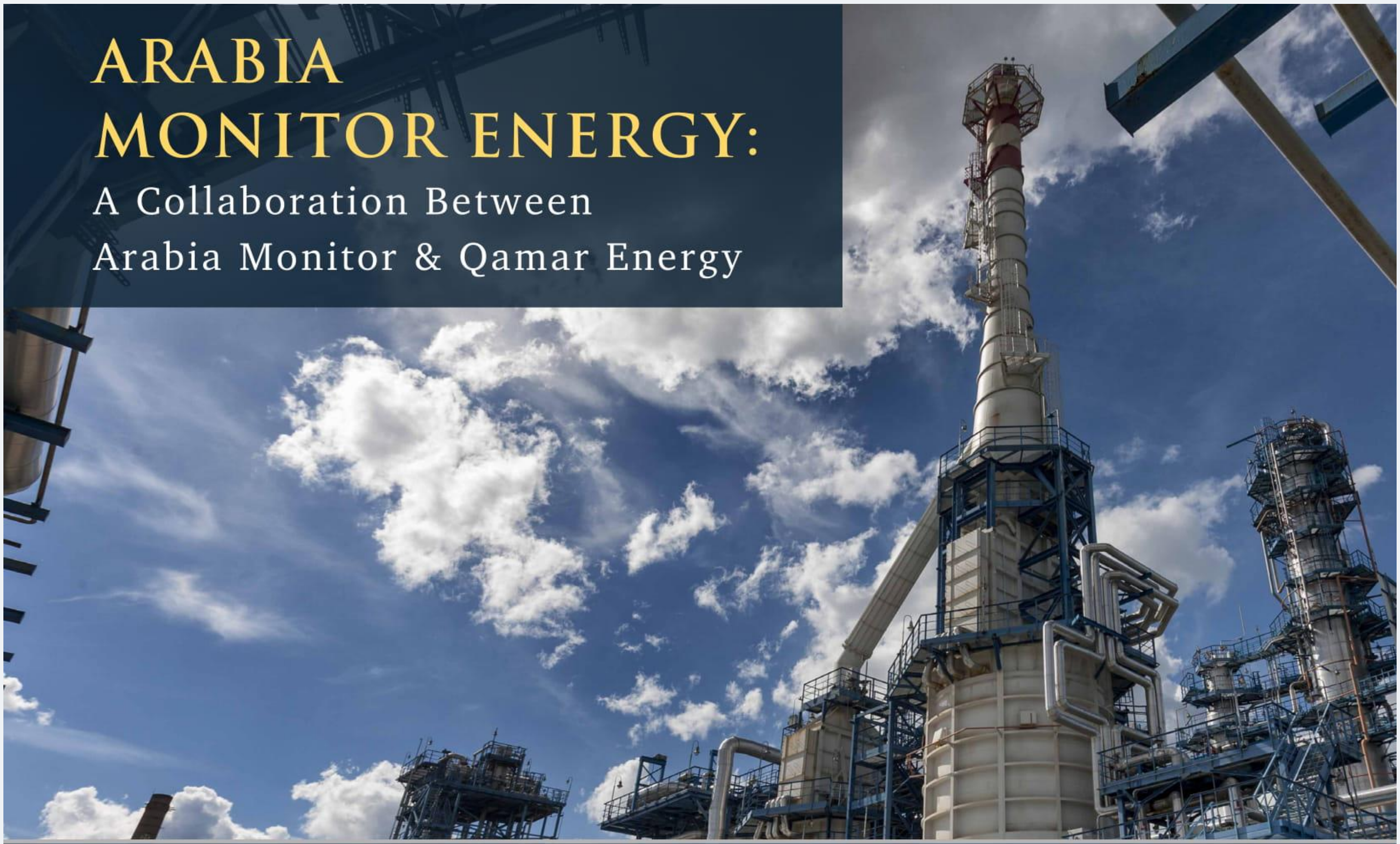
"We are very pleased to embark on this novel venture with Qamar", said Hassan Darwish, ConProc's Managing Partner & COO. "With a new period of dynamism but uncertainty in the energy business, leaders realise how important it is to manage their costs consciously. This partnership will enable Qamar Energy to assist our clients in offering a solution that tackles both sides of the equation. On one side is the expansion of business and revenue, and on the other is cost management and optimisation of spend".

Robin Mills, the CEO of Qamar Energy and leading Middle East energy expert, said that, "A recovery in oil prices and more project activity can mean new pressures on costs. Cost control, insight into expenditure, and added value from procurement beyond lowest-cost are essential to allow regional companies to stay competitive. Qamar Supply Chain Consultancy brings more than 40 years of procurement experience and leading-edge solutions across top multinationals and all continents".

CONPROC

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)

For Further Information, Contact Us On:

info@qamarenergy.com or
+971 4 364 1232
DUBAI - UAE

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

www.qamarenergy.com

Arabia Monitor
Economic Research and Strategy

قمر
QAMAR ENERGY

OPEC WATCH

AVERAGE CRUDE PRODUCTION FOR MARCH 2018

31.96 Mbpd

- 201.0 kbpd

From February 2018

Non-OPEC Oil Supply

59.74 Mbpd

+ 0.38 Mbpd
from Feb. '18

Non-OPEC Crude Output
United States
FSU
Canada

LATEST ORGANISATIONAL CHANGES

- UAE Minister of Energy Suhail Al Mazrouei has been elected as president of the OPEC Conference for one year, with effect from January 1 2018.
- Major General Manuel Quevedo, the Minister of Petroleum and Energy of Venezuela, has been elected as alternate president for the same period.

OPEC & Non-OPEC COMPLIANCE

- Non-OPEC compliance for March fell to 85%, mostly due to a production ramp-up from Russia, whose compliance reached its lowest in 10 months, at 87%.
- Among the FSU countries, Kazakhstan is expected to lead output growth in 2018. OPEC and IEA forecast the country's production to increase 80 kbpd in 2018.
- OPEC compliance reached a new high of 164% in March, up almost 16% from February, due to higher compliance from the UAE and large cuts in production from Venezuela due to its political crisis.
- Angola is currently leading in OPEC compliance (second to Venezuela) with 291% compliance for March, but this is mainly due to lack of investments in offshore fields as onshore fields mature.
- Oman's compliance for March was 98%, as it tries to balance its 1 Mbpd production target while maintaining its promised 45 kbpd cutback.

NEXT OPEC MEETING: 22.06.2018
174th (Ordinary) OPEC Meeting in Vienna, Austria

OPEC PRODUCTION

- While exempt from the original OPEC deal, Nigeria and Libya received production quotas to cap output from their 2017 high of 2.8 Mbpd combined: Libya at 1 Mbpd, and Nigeria at 1.8 Mbpd.
- Libya's output fell by ~38 kbpd in March due to supply disruptions and outages at El-Feel. Nigeria's production crossed its cap of 1.8 Mbpd (~1.810 Mbpd), while Libya's stayed struggling to cross 1 Mbpd, at 968 kbpd.
- Iraq's production fell by 13.1 kbpd in March reaching 4.42 Mbpd as repairs at the Basrah Oil Terminal got delayed and a SPM buoy suffered a leak.
- Saudi Arabia's production fell by 47 kbpd as it takes charge of maintain compliance to push oil prices to the $80-$100/bbl mark.
- Algeria's production that had been raising questions recently over its loyalty to the OPEC cuts recently fell by ~50 kbpd, taking its compliance to over 200%.

KEY MENA ENERGY SCORECARD

APRIL 2018

QATAR CRISIS

Riyadh announced it plans to construct a 60 km ocean channel through its land border with Qatar to accommodate a nuclear waste dump and military base, signalling continuing discord between both countries, which Saudi sees as dragging on for years; Qatar is seeking to enhance its global LNG reach through the Golden Pass project and is in talks with Exxon regarding the latter's Mozambique project to jointly market LNG; Qatar may also invest in Exxon's shale resources in the USA, signalling a deeper relationship with the US major, though this is yet to be confirmed; Qatar renewed the contract for the Al-Bunduq oilfield it shares with Abu Dhabi with Japanese investors on March 13.; Qatargas delivered its first LNG shipment to Singapore on April 09 as it seeks to strengthen its Asian market share.

FEDERAL IRAQ DEVELOPMENTS

The Ministry of Oil awarded 6 out of the 11 blocks it had put up for auction in Bid Round 5 with Chinese firms and Crescent Petroleum bagging the awards; BOC is in the process of finalising service contracts with US KBR ($128 M) and China's Anton Oil ($120 M) to ramp up Majnoon production from 235 kbpd to 400 kbpd and cut production cost by 30% per bbl; China's Zhenhua Oil Company is awaiting the cabinet's approval of its contract with the Midland Oil Company to develop the 8 billion bbl East Baghdad field; production has started at Iraq's first commercial gas field Siba and will output 50 Mscf/d in three months, up to 100 Mscf/d by end-2018; Iraq has backtracked from buying Morocco's only oil refinery – SAMIR – due to a "non-encouraging technical report".

MENA ENERGY PRICE REFORM

UAE will gradually scrap subsidies on electricity and gas sold to power generators to reflect 'real' prices by 2030; Kuwait Parliament's Financial and Economic Committee has approved the proposal of MP Waleed Al-Tabtabaie to cancel the decision to increase fuel prices (enforced in September 2016); Egypt is planning to slash fuel subsidies by 26% in FY 2018/2019 and electricity subsidies by 47% to reduce budget costs by $2.4 B to stay in accordance with its 2016 $12 B IMF deal; Saudi Arabia has introduced the Citizen's Account Program, a cash handout scheme for low- and middle-income Saudi citizens impacted by rising fuel prices, electricity tariffs, and VAT.

MENA NUCLEAR POWER

Saudi Arabia assessing two potential sites – Umm Huwayd and Khor Duweihin – for its first nuclear power plant project near UAE and Qatari borders: tendering to start by end-2018 - delays likely due to technical plans, and commercially due to negotiating nuclear agreement with the US; Egypt and Rosatom signed contract to develop $21B Dabba nuclear plant, raising rhetoric in Israel that Sisi is resorting to former President Gamal Nasser's Pan-Arab policy to overtake Israel's nuclear superiority; UAE finished building Unit-1 (out of 4) of the Barakah Nuclear Reactor with help from Korea Electric Power Corp. but plans to begin loading fuel in May 2018 are delayed to 2019.

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

KEY MENA ENERGY SCORECARD

APRIL 2018

ENERGY INFRASTRUCTURE SECURITY

Israel's IDF has warned Hezbollah that it risks starting another war if it fires rockets at its offshore natural gas platforms in Mediterranean which Lebanon claims fall within its own economic zone; On April 21, the pipeline from Waha to the Es Sider terminal in Libya was sabotaged – an explosion and fire occurred at an isolation valve 21 kilometres from North West Marada, cutting off 80 kbpd of production but operations resumed on April 25; the 70 kbpd El Feel oil field remains shut-in after the National Oil Company declared a force majeure following the withdraw3al of field guards due to wage disputes.

KUWAIT DEVELOPMENTS

Kuwait will invest $22.4 B each year for the next five years to increase the country's output from 3.2 Mbpd to 4 Mbpd by 2020 and will expand its oil tanker fleet twofold over the next 20 years to 60 vessels; KOC has announced launch of operations at Al-Sabriya and the West Al Raudhatain early production facility (EPF) to produce Jurassic oil and gas to help meet domestic demand and limit imports; Kuwait is also expanding refinery capacity with a 615 kbpd facility under construction at al-Zour, with two new refinery ventures underway in Vietnam (which was said to have begun operations end-February) and Duqm (to be launched mid-2018); Kuwait has also begun importing 100 MMcf/d of gas from Iraq.

No Change · Very Positive
Positive
Deterioration in the last month · Negative
Improvement in the last month · Very Negative

IRAN DEVELOPMENTS

NIOC signed an IPC with Dana Energy and Zarubezhneft for the Aban and West Paydar fields, an IPC with Pasargad for the Sepehr and Jufair fields, and an IPC with Pertamina for the Mansouri will be signed May; Iran's Azar oilfield, shared with Iraq's Badra oilfield (operated by Gazprom Neft) is planning to raise production from 30 kbpd to 65 kbpd; Italy's Carlo Maresca signed a $100 M contract with the Iran's Industrial Development and Renovation Organization (IDRO) to construct a 100 MW solar power plant and recently launched Phase-1 of a 10 MW solar power plant in Hormuzgan; Iran has agreed to take the gas produced from the ONGC Videsh-discovered Farzad-B field, which had cause tensions with India over the $11 B development cost – India cut Iranian crude imports by 25% in FY 2017-2018 to pressure Tehran; Trump will announce a decision on the JCPOA on May 12 after the E-3 failed to comply with his requests to alter the agreement's terms.

ABU DHABI DEVELOPMENTS

In updates from its first competitive licensing round, ADNOC awarded OMV a 20% stake in the offshore fields of Satah Al Razboot, along with satellite fields Bin Nasher and Al Bateel, and Umm Lulu after it awarded Total a 20% interest in the Umm Shaif and Nasr concession and a 5% interest in the Lower Zakum concession on a 40-year term last month; ADNOC has appointed Japan's Inpex as the asset leader for Lower Zakum for which it won a 10% interest in February; ADNOC is setting up a new crude oil and refined products trading unit to deviate from its FOB-selling model and expands its downstream sector.

KEY MENA ENERGY SCORECARD

APRIL 2018

MENA RENEWABLE ENERGY

ACWA Power has signed a contract with Shanghai Electric for the 700MW fourth phase of the Mohammed bin Rashid Al Maktoum Solar Park in Dubai.; IFC (World Bank Group) has provided $653M for the development of Egypt's 752 MW Nubian Suns solar project; Oman has received 28 bids for its 500 MW Ibri solar PV plant including Lightsource BP, ACWA Power, NTPC, and Marubeni Corporation; Lightsource BP is also bidding for an EPC for the 100 MW solar project of Petroleum Development Oman; Morocco closed bidding RFPs for MASEN's Noor Midelt Solar Hybrid Complex; Vestas, Siemens, Enercon and Ray Power prequalified for 250MW Gulf of Suez Wind Farm; Morocco also expects the Noor III Solar Tower to deliver power to Morocco's electricity grid by October 2018; Masdar has signed an MoU with Costa Rica's Instituto Costarricense de Electricidad (ICE) for the development of off-grid power generation and floating solar photovoltaic technology.

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

MENA GAS COMMERCIALISATION

ENI has come up dry at its Rabat Deep 1 (RD-1) well offshore Morocco, having encountered tight, fractured carbonates at a depth of 3180m; the company however agreed to develop a gas pipeline in southern Algeria, to link Eni's two producing oilfields in the Berkine basin, Lajmat Bir Roud and Menzel Lejmat, and enable a surplus of 7 Mcm/d of production; ExxonMobil is planning at least two wells in H2 2018 on Block 10 offshore southwest Cyprus with Qatar Petroleum; Egypt's EGAS will hold an international bid round for gas exploration in 11 concession areas by mid-2018, including 8 sea areas and 3 land areas; Egypt signed a $15 B deal announced on February 19 to import up to 32 BCM of Israeli gas over 10 years as a part of its ambition to become Europe's leading natural gas hub and may sign an agreement with Cyprus to connect the Aphrodite gas field with Egypt; Tarek el-Molla has announced that the Zohr concession will produce up to 700 Mcf/d of gas by May 2018, up from the current 350 Mcf/d, and will reach 2.9 Bcf/d by mid-2019.

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

Iraq Energy Forum 2018, Baghdad • *Presentation on* ***Iraq's Solar Energy Potential***

Platts 5th Annual Middle East Crude Oil Summit, Dubai • *Presentation on* **Special Session: Iraq – Production, Compliance, & Political Status**

Petroleum Economist Energy Strategy Forum, Kuwait • *Presentation on* ***Long-Term Investment Scenarios for Energy Majors in MENA***

QAMAR NEWSLETTER ARCHIVES

July 2017 • August 2017 • October 2017 • December 2017 • January 2018 • February 2018 • March 2018

Qamar Energy
HDS Business Centre, Cluster M
Jumeirah Lakes Towers
Dubai, United Arab Emirates
+971 43641232
info@qamarenergy.com
www.qamarenergy.com
@qamarenergy