THE QAMAR NEWSLETTER

SPECIAL SAUDI EDITION, SEPTEMBER 2019

Smoke is seen following a fire at Aramco facility in the eastern city of Abqaiq, Saudi Arabia (Saudi Gazette)

BY THE QAMAR TEAM

Qamar Energy is a leading consultancy based in Dubai, UAE, 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.

Edited by: Roa Ibrahim & Maryam Salman

EXECUTIVE SUMMARY: THE EVENT & ALTERNATIVE SUPPLY

On September 14, Saudi Aramco's eastern oil processing plants at Abqaiq and Khurais were attacked by drones leading to a temporary production suspension of 5.7 million barrels per day (Mbpd) of **crude oil**, almost half of the Kingdom's output and 5-6% of global supply. Majority of the damage was to the oil separation facilities used to separate gas from oil and to the desulphurization columns, which take out hydrogen sulphide from the oil. The disruption also affected 2 billion cubic feet of **natural gas** per day (bcf/d), which will in turn require diversion of more oil to power plants and will impact **petrochemical** companies, some of which already announced a shortage of feedstock by around 40%[1]. Of course, **refined product** exports, most notably diesel, will also dwindle as refinery runs are trimmed by 1 Mbpd. The Houthi forces in Yemen have claimed responsibility for the attacks, though investigations from the US and Saudi Arabia blame Iran.

For now, details on the culprits, the extent of damage, and the duration for restorations remain unclear. Saudi energy minister, Prince Abdulaziz bin Salman bin Abdulaziz, assured that facilities would be restored by the end of September (16 days from the date of the attacks). However, **the situation now appears direr, with a longer outage expected** after better analysing the extent of damage, and the specialised nature of the equipment to be repaired (particularly the stabilisation towers). **We see around 55% of the 5.7 Mbpd disruption to come online by the end of September, or around 3.15 Mbpd.**

The kingdom will resort to increasing capacity at its **offshore fields**, such as Manifa and Safaniyah, by around 0.25 Mbpd and will drain down **stockpiles** for exports. To ease domestic shortages, Aramco's trading arm is planning to import refined products for local demand, including diesel (Saudi was a net exporter of diesel before the attacks). It should be noted that Manifa and Safaniyah are heavy fields, while the current disruption is mostly confined to the Arab Light to Arab Super Light grades. Aramco has already asked buyers to accept different grades in lieu of their lighter counterparts. Saudi's major importers are Asian countries and fortunately, the kingdom does have large **international storage** held in strategic locations. The kingdom could also add production from the **Partitioned Neutral Zone** (shared with Kuwait), though full capacity production (0.5 Mbpd) will take 6 months to come online if an agreement is reached with Kuwait immediately.

OPEC members **UAE**, **Kuwait** and **Iraq** could add around 0.66 Mbpd of total extra production from spare capacity while NOPEC **Russia** could add another 0.295 Mbpd and **Oman** 0.03 Mbpd. The US will undoubtedly refrain from granting waivers to Iranian crude buyers after this attack. Global spare capacity therefore is 0.77 Mbpd, significantly lower than a month ago, when spare capacity, including Saudi Arabia, was 2.77 Mbpd.

In the event of a longer and deeper outage, increased production from OPEC+ would need to be supported by release of stockpiles of both crude and refined products from **IEA members**, though the agency is in no hurry to release any inventories and said the market is "well supplied with ample commercial stocks". China, a prime importer from Saudi and non-IEA member itself, has sufficient stockpiles supplemented by Iranian oil held in bonded storage in recent months.

Figure 1 is our analysis of Saudi's projected oil production in coming days and the impact on Saudi inventories.

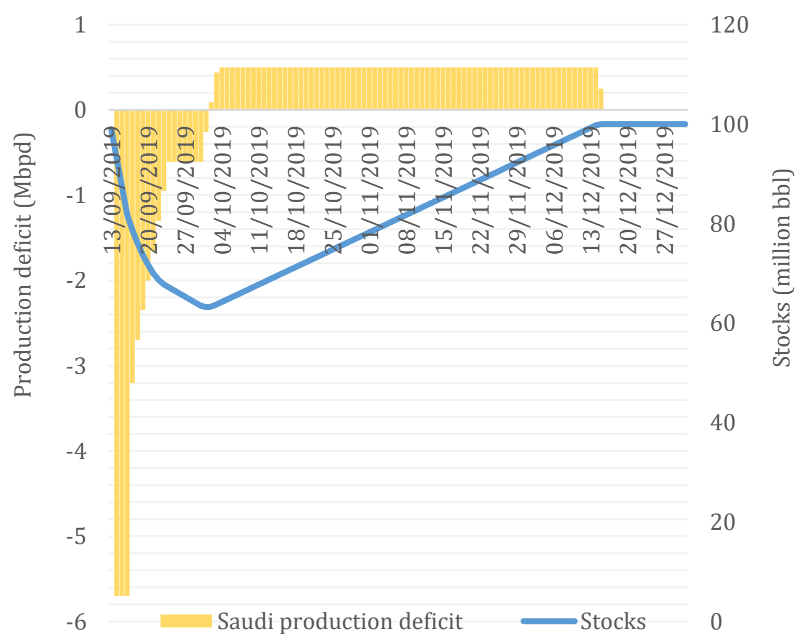

Figure 1 Saudi Arabia's projected oil production and stock levels

Donald Trump promised to release crude reserves from the **Strategic Petroleum Reserve** (SPR), of around 4.4 Mbpd. However, as mentioned in the attached Bloomberg interview, the SPR is not meant to bear all the outage volume, and there have been reports that its facilities have not been maintained well. The SPR could meet domestic refining demand for medium crudes, which are in relatively high demand to make middle distillates due to the upcoming IMO marine fuel regulations. Meanwhile the US briefly became the world's largest oil exporter on a gross basis, though its crude takes much longer to reach Asian buyers compared to from the Gulf.

This attack reminds the market that a large share of the world's oil production, and nearly all of its spare capacity is in a region that is known for its geopolitical risks, and this would most likely add a risk premium to the region's projects, including the Aramco IPO.

For any questions or comments on this Special Edition report, please feel free to contact us on info@qamarenergy.com

[1] Al Rajhi Capital

ARAMCO ATTACK: THE REALPOLITIK OF OIL

Robin Mills • *A version of this article appeared in Asia Times, September 16, 2019*

Saudi Energy Minister Prince Abdulaziz bin Salman, centre, visits the Saudi Aramco plants one day after the attacks in Abqaiq, Saudi Arabia, Sept. 15. (Saudi Press Agency via AP)

As the fires burn at Saudi Arabia's giant Abqaiq oil-processing plant, attention has turned to the immediate impact on oil prices. The missile or drone attack, blamed by the US on Iranian allies in either Yemen or more likely Iraq, has temporarily knocked out half of the kingdom's oil-processing capacity. But more important than the near-term effect is what the attack reveals about the outlook for the conflict between Saudi Arabia and Iran.

The strike is the latest in a series against Saudi and UAE petroleum assets. But the previous incidents were more in the way of calibrated warnings: slight damage to four ships at the United Arab Emirates port of Fujairah, drone attacks on the Saudi east-west pipeline in May, and explosions on two tankers in the Gulf of Oman in June. Missiles from Houthi forces in Yemen have struck other non-oil facilities, such as airports. But the size, sophistication and target of this new attack represents a major escalation, and the first really to shock world oil markets.

Abqaiq is the largest single oil-processing facility in the world, with capacity to handle up to 7 million barrels per day (mbpd) – from the Abqaiq field itself, from Ghawar, the world's largest conventional field, from Shaybah and from Qatif. (Total Saudi capacity is 12.5mbpd.) Abqaiq is the starting point for the Petroline pipeline to Yanbu on the Red Sea coast, an alternative to the Persian Gulf as an export route. A significant amount of Saudi gas production has also been knocked out by the strikes, which will lead the country to burn more oil – perhaps an additional 300,000bpd – to meet electricity demand for summer air-conditioning.

Along with attacks on three of the 300,000bpd processing trains at the Khurais field, 5.7mbpd of production has been cut. Energy Intelligence reports that Aramco hopes soon to bring 2.3mbpd back, and add 250,000bpd of output from the offshore fields, of which the three largest, Safaniya, Zuluf and Manifa, have a combined capacity of 3.025mbpd. Aramco can also supply customers for a while from its large inventories, held at home and in locations such as Egypt, Rotterdam and Okinawa.

Speculation initially raged as to the impact on oil prices – some suggesting gains of a few dollars, some US$10-15 per barrel, others that prices could rise into triple digits with a lengthy outage. But if this attack had to come at all, it comes at a relatively benign moment. The OPEC+ deal means that Saudi, other Gulf and Russian spare capacity is high. US shale growth has been slipping, but the promise of higher prices would revive it. The International Energy Agency may well coordinate a release from strategic stocks held by its members, while now would be a good time for China to bring onshore some of the Iranian crude held in bonded storage. Traders have been worried more about demand and a possible recession than about supply.

This is a far cry from 2008, when markets were very tight and there was supposed to be a geopolitical "risk premium" of $10 or more in oil prices, even though the Middle East political situation was less threatening than it is today.

The worry should be more over the medium term than the short term. As the key node in Saudi Arabia's oil industry, Abqaiq was heavily guarded with multiple rings of defenses, and with redundancy of key units and stockpiling of spare parts. It easily repelled an al-Qaeda vehicle attack in 2006. But this protection has proved ineffective against aerial attack. And it questions the wisdom of concentrating so much processing capacity in one place, however fortified.

Though Abqaiq is the most important, there are dozens of other critical industrial targets across the kingdom: gas-oil separation facilities, export terminals, oil tankage, refineries, petrochemical plants, power stations and desalination plants that provide half the country's drinking water. Hundreds of offshore oil and gas platforms are even more vulnerable, exposed also to submarine drones, particularly in the case of an overt clash with Iran.

The UAE, Riyadh's partner in the war against the Houthis, has similar vulnerabilities, perhaps more so given its dependence on international business, tourism and trade. Large Saudi expenditure on armaments and internal security forces, and the beefing up of US forces in the Gulf, has proved ineffective to ward off such drone, missile and naval attacks.

This dangerous attack has been roundly condemned. Fortunately, no one was killed. But morality is one thing, realpolitik another. From the Iranian point of view, it is retaliation for US sanctions, backed by the Saudis, that have eliminated most of Tehran's oil exports – a more severe blow than that suffered by Saudi Arabia on Saturday. The Iranians underestimated how far the US could bully unwilling allies into compliance, and how little Russia and China could and would do to help them out. But it is hard to say they miscalculated in failing to negotiate with the Trump administration, as after the US abandonment of the JCPOA (Joint Comprehensive Plan of Action) nuclear deal, they have not been presented with an offer capable of acceptance.

The US-Saudi axis, on the contrary, has clearly miscalculated, thinking they could take actions at a time and place of their choosing without the risk of response. Repeatedly, Iran has shown an ability to throw them off balance. Untethered from the global market, constraints on Tehran have been broken.

Of course, the question of why now invites speculation. After the firing of US national security adviser John Bolton, is Iran escalating again to de-escalate, or have the hardliners chosen to slam the door on diplomacy?

This does seem like a vulnerable moment in Riyadh. The new Saudi oil minister, Prince Abdulaziz bin Salman, was tasked with accelerating the share listing of Aramco, now thrown into renewed doubt. He had only last week cajoled Iraq and Nigeria into promising better compliance with the Organization of the Petroleum Exporting Countries' production cuts. Now they, Russia and the OPEC allies of the UAE and Kuwait have an excuse to resume all-out pumping.

Retaliation will expose further Saudi vulnerabilities, and risk spiking oil prices and economic downturn ahead of the US election campaign, in a crisis many would see as President Donald Trump's fault. Further offers of negotiation or sanctions waivers would look weak. Even if there are no further attacks for a while, the memory will linger. Riyadh's strongest weapon, its oil industry, has been shown also to be its Sword of Damocles.

GLOBAL OIL STOCKS MITIGATE MARKET IMPACT OF SAUDI ATTACKS

Robin Mills • *A version of this article was published by the Arab Gulf States Institute in Washington, September 17, 2019*

For a facility described as the "very heart of the global oil industry," the market response to the attacks on Saudi Arabia's Abqaiq oil processing plant and Khurais oil field has been muted. Brent crude jumped by 20%, or almost $12 per barrel, to $71.95, the largest one-day gain since it began trading in 1988. But it fell back during the day to around $69, and to around $64.50 on Tuesday following Saudi reassurances, which seems moderate by comparison to the levels over $110/bbl during Libya's revolution just eight years ago.

The gain in futures prices since the attacks is less but amounts to about $2/bbl out to the end of 2022, and $1 thereafter, suggesting anticipation of continuing geopolitical risk. Still, a $1 premium is a far cry from 2008 when, in less threatening circumstances but a much tighter market, it was regularly reckoned that prices contained a $10 "fear premium."

Yet the missile or drone strikes on Abqaiq and the nearby giant Khurais field have cut 5.7 million barrels per day of crude oil output, more than half Saudi Arabia's current production of 10.5 mb/d. In addition, 2 billion cubic feet per day of natural gas, and 700,000 b/d of natural gas liquids, have been disrupted, along with the resulting petrochemical products. Abqaiq, with capacity of 7 mb/d, receives crude oil from the Abqaiq field itself, Ghawar (the world's largest conventional oil field), Khurais, Qatif, and Shaybah.

This represents the largest sudden loss of production in history, bigger than the 1973 embargo, the 1978-79 Iranian Revolution and outbreak of the Iran-Iraq War, Saddam Hussein's 1990 seizure of Kuwait, the 2002-03 Venezuelan general strike, or the 2003 US invasion of Iraq (albeit these were in smaller world markets). It comes at a moment when global markets are well-supplied, in spite of US sanctions on Iran, which have cut some 1.6 mb/d or more of exports, and Venezuela's economic collapse, costing about 1.3 mb/d since the start of 2017.

So why is the market response not more panicked? Partly because Saudi Aramco's guidance is that much of this lost production will be quickly restored. Energy Minister Prince Abdulaziz bin Salman told a press conference in Jeddah September 17 that 2 mb/d of Abqaiq's capacity was already back online, repairs would be complete by the end of September, October production would be

9.8 mb/d, and Aramco's full capacity of 12 mb/d would be restored by November. This recovery would be surprisingly quick given the extent of the damage and the specialized nature of much of the equipment, but could reflect a combination of existing redundancy, spares on site, emergency workarounds, and preparedness.

In the meantime, unfortunately, much of the kingdom's spare capacity also runs through Abqaiq, but it can boost production from offshore fields, mostly heavy crude, by 250,000 b/d. Aramco's legally required maximum sustainable capacity is 12 mb/d, of which 150,000 b/d is Bahrain's share of the Abu Safa field. This capacity has to be available within three months, and therefore not all of it is necessarily in play yet.

Abqaiq processes mainly Arab Light and Super-Light grades, and this could present challenges for buyers now being offered heavier replacements. Refineries would have been hoping to produce more middle distillates to meet shipping demand ahead of the 2020 changeover to low-sulphur bunker fuels, and the loss of medium grades of Saudi crude now, as tanks would be filled in anticipation, is not helpful.

Saudi Arabia might also accelerate attempts to bring back the 500,000 b/d capacity Neutral Zone shared with Kuwait, closed since 2014 by a dispute. That had been a priority for Prince Abdulaziz even before the September 14 attacks.

For this month, Aramco will meet customers' needs from its reported 187.9 million barrels of stored crude, an estimated 73 million barrels of which is in the kingdom, and other amounts at locations including Egypt, Rotterdam, and Okinawa, totaling some 26 million barrels. However, a significant share of these inventories are likely to be oil in pipelines and tankers that is in transit to buyers and not truly storage.

A simple illustration takes Aramco's figures for the partial restoration of Abqaiq and Khurais by September 17 and full restoration by the end of September, adds additional output from the offshore, but excludes a possible restart of the Neutral Zone and boosts from any other fields or redundant facilities. Lost output over September (assuming production would have been at 10.5 mb/d in the absence of the attacks) would be 36 million barrels, or an average of 2.25 mb/d, draining one-third of the company's readily available inventories. After full recovery, two months pumping at elevated levels of 11 mb/d would then return stocks to their starting point.

This calculation ignores the option of strategic stock releases. The International Energy Agency, set up for precisely this purpose in 1974, will consider approving a coordinated release of reserves by its members, who are all supposed to hold at least 90 days' worth of net imports (European Union members are required to have 90 days of total consumption). This amounts to 1.55 billion barrels, of which the US Strategic Petroleum Reserve holds 630 million barrels, some having been sold off recently to plug budget holes, and the president could approve a release. China, not a full IEA member, has at least another 287 million barrels of government stocks. So less than 2% of these emergency holdings would cover for a month's outage in the illustration above.

Other countries can also increase output. The United States would be unlikely to reward Iran for an attack blamed on Tehran by allowing some of its sanctioned oil back to the market, but China might well step up purchases nonetheless. UAE oil production capacity has been advancing toward its 3.5 mb/d target, well above its 3.065 mb/d OPEC target and it with Kuwait, Iraq, and Russia could probably boost output by about 1 mb/d in total.

But Saudi officials have reportedly been telling OPEC colleagues they do not need to increase production, fearing that once out of the OPEC+ agreement, with OPEC and leading non-OPEC producers, it might be hard to corral them to comply again. On September 12, Prince Abdulaziz had just finished pressuring Iraq and Nigeria to improve their conformity with production cuts at a meeting in Abu Dhabi.

The sharp increase in prompt prices will incentivize drilling by US shale producers, though the longer-dated gain of $1-2/bbl will not make much difference for hedging. US production growth has been slipping in recent months, but somewhat higher prices, and perhaps some encouragement for long-suffering investors, could help. Certainly, if there is a major and long-standing disruption to Gulf exports, shale will revive.

This all assumes there are no more attacks, nor any further disruption in other volatile countries including Libya, Venezuela, and Nigeria. Depending on the degree of retaliation by the Saudis or the United States, further damage to oil facilities might not be limited to Saudi Arabia. The UAE has opened a low-key dialogue with Iran following its partial withdrawal from Yemen but remains closely aligned with Riyadh. In the event of a major conflagration, it would also be easy for Iran to disrupt Iraqi oil production and so worsen the market impact.

Overall, then, the relatively muted market response to a historically massive disruption reflects confidence in Saudi Arabia to restore most output quickly, others' spare capacity, strategic stocks and, if the crisis is extended, the fast response of US shale. It indicates the persistence of economic concerns, including over the trade war that has depressed prices this year.

And it suggests that, despite the likelihood of some retaliation, and the previous incidents of lower-level attacks on tankers and pipelines, there is not too much fear of a real conflagration or further serious strikes on oil facilities. That judgement may be borne out but seems premature: This confrontation is far from over, and Abqaiq is not the only petroleum vulnerability in the Gulf.

BLOOMBERG INTERVIEW: OIL PRICES AFTER THE SAUDI ATTACKS

Robin Mills • *September 17, 2019*

Watch here

RESPONSE TO ABQAIQ ATTACK

Robin Mills • *A version of this article appeared in The National, September 19, 2019*

Picture: Middle East Monitor

Newly-appointed Saudi oil minister Prince Abdulaziz bin Salman has had a harsh introduction to his new post. In the wake of Saturday morning's attacks on the critical Abqaiq oil processing plant, he reassured the market at a Jeddah press conference on Tuesday. The lost supply may be less than first feared, but there are still important lessons to learn.

Some 5.7 million barrels per day of production capacity, from state oil giant Saudi Aramco's total 12 million bpd, were lost to the strikes on Abqaiq and the nearby Khurais oil-field. Khurais is now pumping again, though it is not clear whether it is at full capacity. Abqaiq, with normal capacity of 7 million bpd, is back to 2 million bpd operational, with its immediate pre-attack level of 4.9 million bpd planned to be regained by the end of September, and nearly full capacity restored at the end of November.

If indeed Aramco can meet customers' needs from storage during September, then restore sufficient production by the end of the month, that would be an impressive achievement and far better than seemed likely after the shocking images from Saturday.

Once full production and exports return to the market, oil prices should sink back towards pre-attack levels. Futures prices gained $2 per barrel for nearby years, and $1 per barrel for long-dated futures. This represents a slightly elevated level of concern over future threats to supply. It is, though, much less dramatic than the tight market of 2007-8, when a much less volatile geopolitical situation was assessed to add a $10 "fear premium" to oil prices.

We are still at a very early stage of assessing and understanding the attacks, their impact and recovery from them. If the largest ever abrupt loss of oil production indeed proves transient, the oil market will have dodged a bullet – this time.

This is the time to learn some key lessons, to improve the resilience of global energy supply. Firstly, Saudi Arabia and Aramco will, no doubt, be reviewing their defences, the redundancy of key industry functions given the extraordinary concentration of equipment at Abqaiq, and the procedures for emergency response and repair.

Secondly, assuming this attack was indeed directly or indirectly Tehran's doing, the confrontation between Iran on the one side, and the US and its Arabian Gulf supporters on the other, has heated up several notches. There have already been attacks, albeit limited, on pipelines and tankers. Energy infrastructure could be at risk not just in Saudi Arabia, but in important producers such as Iraq. Future strikes could be more devastating or more subtle, and could include cyberwar, like the Shamoon virus that struck Aramco in 2012.

Conversely, US senator Lindsey Graham called for a retaliatory attack on "Iranian oil refineries", which would set a dangerous precedent that attacks on energy facilities are legitimate. The country's exports have already been mostly cut off by US sanctions.

Some vulnerabilities have been strengthened, such as building bypass pipelines to the Red Sea in Saudi Arabia and the UAE's Indian Ocean coast, that bypass the Strait of Hormuz, always previously identified as a chokepoint. Strategic stock holdings continue to be constructed, not just in Saudi Arabia, Fujairah and the Omani port of Duqm, but also close to consumers, as in India. Nevertheless, those who threaten regional energy security have proved adept at finding new openings to exploit.

Thirdly, the international response has not been very coordinated. Donald Trump said that he had authorised a release from the US's Strategic Petroleum Reserve, "if needed, in a to-be-determined amount". Meanwhile, the International Energy Agency, whose job it is to coordinate developed countries' response to energy supply shocks, said that "for now, markets are well-supplied", and did not immediately recommend a release of emergency stocks. Russia, which of course benefits from higher oil prices, condemned the attack but criticised the US for its campaign against Iran.

Fourthly, despite this well-supplied market, spare capacity is concentrated and quite tight. Most of it, some 2 million barrels per day, was held in Saudi Arabia. Another 700,000 bpd or so is spread between three Gulf countries: the UAE, Kuwait and Saudi Arabia. A further 500,000 bpd is in the Neutral Zone between Saudi Arabia and Kuwait, shut off for four years by a political dispute, and would take several months to restart even following a deal. Russia, which suffered its own major production hiccup in May with contamination of oil in its Druzhba pipeline to Europe, might have as much as 300,000 bpd spare.

That is essentially it. And spare capacity could be required to meet further losses from Venezuela's economic collapse, insecurity in Libya or Nigeria, or other surprises. The deal on production limits between OPEC, Russia and some other non-OPEC producers has held for now, but needs some flexibility to cope with the unexpected.

And as analyst Anas Alhajji likes to remind us, "quality matters". US light crude or Russian condensate is far from a perfect substitute for the medium-grade Saudi crudes processed at Abqaiq, or the heavy sludge that emerges from Venezuela. Saudi domestic gas output was also badly hit by the attacks; gas has become an ever more critical but underappreciated part of the regional energy economy.

The market has been sanguine about the limitations of quality and quantity, partly because of confidence in the buoyancy of US shale producers, partly because of a gloomy outlook for demand. But serious disruptions and price spikes are not just bad news for consumers. From the perspective of oil producers, they dent demand, and advance the attractions of non-oil technologies, such as electric vehicles. Now is a good time to dampen the combustible mix of threats to regional energy.

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.

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