

THE FUTURE OF MIDDLE EAST ENERGY

How the region's oil producers are
responding to structural changes in energy

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THE NEW, NEW NORMAL

Structural changes in energy demand and oil supply mean oil producers are repositioning themselves for the new era

After three years of economic recession and fiscal consolidation that has mauled business in the Middle East and wreaked havoc with government finances, the recovery in oil prices since the middle of 2016 has left oil producers breathing sighs of relief as they look to return to business as usual.

At first glance, the fundamentals look good. Global demand for energy is projected to rise about 1.5 per cent every year until 2050, driven by a growing global population that is forecast to reach 10 billion people by 2050. And throughout the coming three decades, oil will still be the dominant source of energy. But producers must tread carefully. Nothing is as simple as it appears. Certainly not in the world of global energy.

Demand for oil is expected to slow sharply towards the end of this period due to the implementation of fuel-efficiency standards and improvements across all forms of transport. This slowdown could begin as soon as the early 2020s, despite oil demand reaching 104.7 million barrels a day (b/d) by 2023, up from about 98.9 million b/d in 2017.

Fundamental changes in energy are already taking place in both the direction and nature of demand. As the Middle East's traditional customers in North America and Western Europe become less dependent on the region's oil, the focus is shifting eastwards, towards the huge, high-growth markets of Asia, and in particular India and China, where rapid population growth and increasing wealth is driving long-term growth in demand for crude, refined products and petrochemicals. In addition to this, the shift to gas-fired power plants, the electrification of vehicles and cleaner transportation fuels are all contributing to a rapidly changing picture for Middle East oil producers.

The fall in oil prices in 2014 has exposed the dangers of reliance on crude export revenues and regional producers are seeking new revenue streams. As a result, petrochemicals has returned to the forefront of plans, with demand expected to grow 150 per cent by 2040. Middle East producers are looking to secure a bigger share of Asia's fast-growing market for polymers, and players such as Saudi Aramco, Abu Dhabi National Oil Company and Kuwait Petroleum Corporation are taking a long-term view, changing the calculus of downstream integration. Access to cut-priced feedstock will be a key competitive advantage for the region. As will a willingness to stump up the cash if needed, or tap into debt markets.

Oil producers must develop their plans strategically to reflect these structural changes in both energy demand and oil supply that are transforming the fundamentals of the energy markets. They must reposition themselves for a 'new normal'.

In this special research report, MEED examines the strategic plans under development by the region's national oil companies, and what they mean for investors and businesses in the region, from international oil companies to oil field services firms, and engineering, procurement and construction contractors.



EXECUTIVE SUMMARY

Regional energy industry heads into era of unprecedented change for global energy use and its key growth markets

- After 18 months of production caps agreed by Opec and non-Opec oil producers, global oversupply of oil is reducing. The world's biggest oil producer, Russia, says cooperation with Opec, and particularly Saudi Arabia, will continue for many years. This suggests greater long-term stability in the markets.
- With the world's population projected to rise to some 10 billion people by 2050, from 6 billion today, global demand for energy will increase about 1.5 per cent every year until then. Global oil consumption stands at about 98.85 million barrels a day (b/d) in 2018 and is rising annually by 1.5-1.6 million b/d, driven by the emerging Asian markets.
- Over the next 20-30 years, oil will continue to dominate energy supply, but production and demand will slow towards the end of this period due to the implementation of fuel-efficiency standards and improvements across all main forms of transport. The slowdown in oil demand growth could begin as soon as the early 2020s.
- The International Maritime Organisation has set targets to cut sulphur content in marine fuel by 2020, obliging operators to move from heavy fuel oil to low-sulphur content fuels such as gas oils. Some are looking at alternative power.
- The pressure on oil companies to hunt for ever-larger oil fields is growing as the world's oil fields deplete at 4-7 per cent a year, equivalent to about 3 million b/d. Oil field depletion presents an obstacle for oil producers in meeting the growth in global oil demand.
- The fall in oil prices in 2014 exposed the dangers of reliance on crude export revenues. As a result, regional producers are seeking new revenue streams. Petrochemicals are seen as the source of the greatest growth in the next two decades, with demand expected to grow 150 per cent by 2040.
- Companies such as Saudi Aramco, Abu Dhabi National Oil Company and Kuwait Petroleum Corporation aim to secure a bigger share of Asia's fast-growing market for polymers. The biggest factor in favour of Middle East producers is access to cut-priced feedstock.
- About \$919bn of energy investments are expected in the Middle East and North Africa in the coming five years, according to Apicorp. About \$345bn is already under execution, and a further \$574bn is planned.

CONTENTS



7-8

THE FUTURE OF ENERGY DEMAND

There is no need to worry about oil demand ... yet

9

THE OUTLOOK FOR OIL PRICES

Global oil prices impacted by realigning alliances

10

PEAK OIL

Could we see a peak in demand for oil?

11

THE SHIFT FROM WEST TO EAST

Competition intensifies to supply Chinese market

12

THE CHANGING DRIVERS OF DEMAND

Energy suppliers move downstream

28-29

KEY POLICY TRENDS

Governments seek to diversify their economies

30

PRIVATE SECTOR PARTICIPATION

Saudi Aramco and Adnoc drive privatisation plans



13-26

COUNTRY PROFILES

13 Algeria

14 Bahrain

15 Egypt

16 Iran

18 Iraq


19 Kuwait

20 Oman

22 Qatar

24 Saudi Arabia

26 UAE



“Global energy is at a critical turning point. The challenge facing the region’s oil and gas producers is no longer simply about being able to balance supply and demand. Rather, the future questions facing the world’s energy providers are about how, where and when energy supply is produced, and how, where and when it is used.”

WHAT DOES THE FUTURE HOLD FOR ENERGY DEMAND?

There is no need to worry about oil demand ... yet

With the world's population projected to rise to 10 billion people by 2050, from about 7.6 billion today, and with large parts of the world still to gain access to sustainable sources of energy, there will be no let up in demand for hydrocarbons any time soon.

In 2017, global demand for oil rose about 1.6 per cent, according to the International Energy Agency (IEA) – double the average rate of increase over the past decade.

Despite this, global energy remains at a critical turning point. The challenge facing the region's oil and gas producers is no longer simply the balance between supply and demand. Instead, the questions facing the world's energy providers are about how, where and when energy supply is produced, and how, where and when it is used.

Demographic expansion and socio-economic development, particularly in the fast-growing economies of Asia — from the giant Chinese and Indian markets to the smaller Asian economies with rising middle-classes — are set to make up the lion's share of future energy demand growth, whether from conventional or renewable sources.

At the same time, changing policy goals coupled with technological advancements are transforming both energy consumption and supply.

The quest for energy security is therefore focusing on the diversification of energy sources away from fossil fuels, while government and industry alike are seeking to reduce costs by harnessing the latest technologies to drive greater energy efficiency and reduce consumption.

Fuel efficiency

For the next 20-30 years, oil will continue to dominate primary energy requirements despite the plateau in production and demand expected towards the end of this period. Contrary to popular opinion, what is likely to curb demand is not the increasing adoption of alternative energy sources or even electric cars, but rather the broader implementation of fuel-efficiency standards and improvements across all main forms of transport — particularly in the trucking industry.

Speaking in April to an audience of energy industry specialists and media, IEA secretary-general Fatih Birol explained that more than 50 countries have car fuel-efficiency standards, but only four have truck fuel-efficiency standards — a nod to the major inroads yet to be made in significantly reducing oil demand growth. This is important because the

improvement in the economic lot of communities, particularly in the developing world, is often followed by growth in the trucking industries in these countries in order to feed this economic growth.

"Even if every second car sold [globally] was an electric car, global oil demand will still continue to grow ... because demand growth is not coming from cars. Today, one third of the global oil demand growth comes from Asian trucks only," Birol told the audience gathered at Columbia University's Centre of Global Energy Policy (CGEP) in New York.

Regardless, a major obstacle for oil producers in meeting the growth in global oil demand is the exponential rate of depletion of oil fields around the world, which is putting considerable pressure on both international oil companies (IOCs) and national oil companies (NOCs) to hunt for ever-larger oil fields to replace this loss in output.

Field depletion

In January, French oil field tubular goods manufacturer Valourec warned that to keep up with current global oil demand of about 96 million barrels a day (b/d), field depletion was "above and beyond" the most important issue for producers to contend with. Current annual depletion rates of the world's major fields average at 4-7 per cent, or about 3 million b/d in ageing fields, while demand continues to grow by between 1.5-1.6 million b/d, according to the IEA.

The company highlighted how US shale oil production alone "is insufficient to offset worldwide depletion", underscoring the concerted and increasingly closer coordination needed between Opec and non-Opec-producing nations to shore up oil supplies in the medium-to-long term. The US is projected to see an additional 1.6 million b/d of total liquid production — mainly from shale — by the end of 2018.

However, while rapidly rising shale oil and gas output from the US poses strong competition to Opec and large non-Opec producers such as Russia, the main ongoing issue for US producers is getting its product to market in a quick and efficient manner. The impetus for doing so is the comparatively short lifespan of US shale oil and gas wells, since output can fall by 40 per cent in just one year. Infrastructure to bring products from short-lived unconventional deposits in formations such as the Bakken and Eagle Ford fields pose logistical challenges to operators, who usually have to opt for flexible yet cost-inefficient land transport options over pipelines, despite their expensive initial build costs.

Natural gas has been touted as the energy source of choice during the energy transition due to its abundance across the world, from the shale fields of the US and the giant shared Gulf formations being exploited by Qatar and Iran, to the huge gas fields in Russia and Australia.

According to BP's 2018 Energy Outlook for the next 20-25 years, gas is seen as a 'bridge' fuel by both developed and emerging-economy nations as they seek to reduce carbon emissions from coal use in their industrial sectors.

The global power sector, while keeping pace with economic growth, is meanwhile likely to see a plateauing in demand for natural gas, despite ongoing gas consumption for industrial, commercial and domestic purposes. This is mainly due to gas competing with coal and renewables, despite expectations of a sharp decrease in demand for coal from large consumers such as China and India by 2040.

In 2017, 30 per cent of total growth in the world's gas demand was generated by China alone. Much of the growth comes as a result of authorities seeking to reduce localised pollution from coal-fired power plants. Faced by the twin challenges of a mounting public health crisis and maintain-

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Natural gas

Roughly 150 billion cubic feet of additional daily natural gas production is expected to come online by 2040, according to forecasts, bringing total global production to 500 billion cubic feet a day (cf/d).

Expected to be brought to consumer markets in liquefied natural gas (LNG) form or via pipeline over the next two to three decades, natural gas will experience strong and widespread demand not only from emerging markets such as those in Asia and Africa, but also from Europe and North America.

World LNG supplies are expected to experience the sharpest increase in availability over the next 20 years, with nearly half of the increase generated over the next five years alone. LNG could quite easily surpass regional pipeline supplies at this rate.

While the LNG scene is a buyer's market, growing demand from China and India could eliminate the supply-demand differential early in the next decade, according to industry observers. Since the lag between the building and supply phases of the LNG project cycle is wide enough for demand to catch up with ease, this will translate into a need for new investment in greenfield projects around the world.

As the global transport sector grows on the back of economic progress in emerging economies, it is expected to be the single fastest-growing sector over the next 20-30 years.



The world's population is set to rise to 10 billion people by 2050, from about 7.6 billion today



GLOBAL OIL PRICES IMPACTED BY REALIGNING ALLIANCES

Factors such as the looming US-China trade war and fresh sanctions on Iran will have consequences on the outlook for oil prices

Over the past year or so, forces beyond the 'traditional' factors have been at play in oil market dynamics. The latest is the potential knock-on effect of aggressive trade tariffs being slapped onto China, the world's largest energy consumer and manufacturer. The motivation behind the move, according to US President Donald Trump's administration, is to counter its trade deficit with China. In response, China has targeted rising US oil imports for duties.

The result of such disputes could threaten nearly \$1bn in monthly US crude sales to China, leading one energy market observer to say: "With Trump's politics, we're in a world of realigning alliances. China will not just swallow US tariffs."

On the other hand, this could create an opening – in the short-to-medium term at least – for Opec producers to plug a potential shortfall in Chinese oil demand. This comes at the same time as Opec producer Saudi Arabia and non-Opec Russia indicated ahead of the oil group's 22 June meeting that they will seek to nudge Opec to increase production by 1.5 million b/d in the third quarter of 2018.

Temporary stability

Given this backdrop, the production hike has the potential to provide market stability, even if it is only short-lived as producers of cheap US shale oil — especially from the prolific Permian region in west Texas — seek better returns overseas and create downward pressure on global oil prices.

This might well chime with the US Energy Information Administration's latest short-term forecast, which sees much of the predicted 210,000 b/d growth in worldwide oil production in 2019 coming from the US. In June, it calculated Brent crude would average \$71 a barrel in 2018, dipping to \$68 in 2019, based on global oil inventories rising "slightly" in the second half of 2018 and into 2019.

It is worth also considering a few other factors. While Canada and Brazil are expected to also see significant growth in oil output next year, Opec producers Venezuela and Iran could drag down the group's total output for 2019. Venezuela is suffering from a combination of mismanagement of its oil industry, missed payments to service providers and a sharp decline in active rigs, among other issues, while Iran is under pressure from fresh US sanctions targeting its energy-producing sector, following the

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 Fresh sanctions on Iran could affect Opec's output

Trump administration's unilateral withdrawal from the Joint Comprehensive Plan of Action. The extent to which these sanctions will affect Opec's output was still an unknown quantity at the time of going to press with this report.

ARE WE LIKELY TO SEE A PEAK IN DEMAND FOR OIL?

Long-range forecasts suggest that while demand for crude oil will wane by the 2040s, with the reasons for the decline in demand follow the confluence of some interesting global trends

Although much has been made and written about the idea of peak oil, particularly concerning the first decade of this century in terms of declining availability of 'easy' oil, the market dynamics have swung back to the issue of demand as opposed to supply. Advances in technology have opened up harder-to-reach unconventional resources and producers are once again seeking ways to stave off the inevitable plateauing and reversal of global oil demand over the coming decades.

Long-range forecasts up to the 2040s suggest that while demand for crude oil will wane by then, due to natural gas and alternative energy sources increasing in popularity, the reasons for the decline in demand follow the confluence of some interesting global trends.

The slowdown could begin as soon as the early 2020s, despite oil demand reaching 104.7 million b/d by 2023, according to the International Energy Agency.

One trend is the strengthening growth in sales for the global petrochemicals industry. As millions of people move up the economic ladder into the middle class, particularly in Asia, they are driving demand for greater consumer goods — demand that can still largely only be met through the production of oil-and-gas-derived petrochemicals. Examples of such goods are ubiquitous: from fertilisers and food preservatives to paints and lubricants.


As greater economic growth and increased commercial transportation go hand in hand, operators in this space will wish to keep costs down by seeking efficiencies wherever they can. Faced with tightening emission-reduction targets, global supply chain operators, particularly marine shippers, will naturally be among the first to be affected and will try to modulate their fuel demand accordingly.

Marine fuel

As seaborne shipping is by far the easiest and most economic means of transporting large quantities of cargo around the world, any gains in efficiency and cuts in emissions will have significant impact on the type of fuel being produced for this market. The International Maritime Organisation (IMO) has set aggressive targets to reduce the sulphur content in marine fuel from the current 3.50 per cent mass by mass (m/m) to 0.10 per cent m/m by 2020 — a move that will oblige operators in the major trade routes of the world to find ways to meet the new regulations. The IMO suggests that in order to meet the new regulations, the heavy fuel oils currently used in shipping will need to be blended with low-sulphur content fuels such as gas oils. Some shipping companies are already looking at alternative cleaner ways of powering their fleets, with some operators testing LNG and kite-and-sail powered vessels.

The IEA, however, highlighted earlier this year that its forecasts on the marine fuels sector are not conclusive, saying that "the total demand for oil products will not be dramatically altered, but the impact of the changes on the product mix is a major uncertainty in our forecast."



 Advances in technology have opened up harder-to-reach unconventional resources

EMERGING ASIA AND THE SHIFT FROM WEST TO EAST

As China has increasingly turned to crude imports to supplement its domestic oil production, Middle East oil producers have found themselves aggressively competing to supply the Chinese market

Abu Dhabi's decision to award its first new offshore oil concession to a consortium of three Indian oil companies earlier this year highlights the increasing shift in focus in the Middle East. Its traditional reliance on western oil majors for technology has now been matched by the need to secure outlets in the world's key demand growth centre, Asia.

Another deal was signed with China National Petroleum Corporation. China, as Asia's biggest economy and one of its fastest-growing energy consumers, has turned increasingly to crude imports in recent years to supplement its not inconsiderable domestic oil production. About 48 per cent of those imports were supplied from the Gulf region in 2016, even as US and European demand for Middle East crudes declined. That has led to intense competition between the major Middle East oil producers to supply the Chinese market.

As the world's third-largest importer, the attraction of India is also clear. The IEA forecasts that India's demand will grow more than any other country, doubling to 10 million b/d by 2040. Abu Dhabi National Oil Company's (Adnoc's) three new Indian partners – ONGC Videsh, Indian Oil Corporation and Bharat PetroResources – operate more than 2.65 million b/d of refining capacity. Securing some of that will be a huge win for Abu Dhabi.

India expansion

The UAE is not the only country eyeing India as a source of captive demand. Saudi Aramco also hopes to build a new 1.2 million b/d grassroots refinery at Maharashtra on India's western coast by 2021. It would be Aramco's first foray into India's refining sector. It already has joint ventures in the US, South Korea, Japan, China and Indonesia. The oil giant also has plans for further projects in China and Malaysia, and wants to eventually raise its total downstream capacity to 8-10 million b/d, from about 5.4 million b/d currently.

The recent rise of US crude and condensate exports to Asia has also forced Middle East producers to focus on their key customers. Kuwait has led the way among



Asia is the world's key demand growth centre

“The recent rise of US crude and condensate exports to Asia has forced Middle East producers to focus on their key customers. Kuwait has led the way, investing in foreign refinery projects back in 2008. That decision now looks far-sighted. Kuwait Petroleum International will continue to look for new opportunities to invest in overseas projects, especially in India, Indonesia and China.”

Middle Eastern producers, investing in foreign refinery projects back in 2008, well before anyone thought of the US as a potential exporter. That decision now looks far-sighted. Kuwait Petroleum International, the country's overseas investment arm, will continue to look for new opportunities to invest in overseas projects, especially in India, Indonesia and China.

Along with the equity stakes, the rise of state-backed Indian and Chinese oil companies will also help their engineering, procurement and construction companies, who will be able to piggy-back on the new investments to help win projects in the Middle East.

MIDDLE EAST ENERGY SUPPLIERS SWITCH FOCUS TO DOWNSTREAM

As regional producers seek new revenue streams, petrochemicals have moved to the forefront of their plans, with demand expected to grow by a massive 150 per cent by 2040

Having made its name as a crude exporter, Abu Dhabi National Oil Company (Adnoc) is the latest Middle East producer muscling in on the global refining and petrochemicals game, announcing recently an ambitious \$45bn spending plan to turn its Ruwais refinery into a sprawling integrated refining and petrochemicals behemoth.

The collapse of oil prices in 2014 exposed the dangers of the region's heavy reliance on crude export revenues, and the battle for market share in key consumer markets has sharpened the focus on seeking new revenue streams.

Adnoc and other regional producers now see petrochemicals as the source of the greatest growth in the next two decades, with demand expected to grow 150 per cent by 2040. CEO Sultan al-Jaber told delegates at the Adnoc downstream investment forum in Abu Dhabi that "given the projected increase in demand for petrochemicals and higher-value refined products, we are repositioning Adnoc to become a leading global downstream player."

"Adnoc is a good example of a national oil company (NOC) that wants to take more commercial charge of its future," said Stephen George, principal consultant at KBC. "While international oil companies are focused on their quarterly results, NOCs like Aramco and Adnoc can take a much longer-term view, changing the calculus of downstream integration."


Polymers market

The emirate is not the only player banking on petrochemicals. Adnoc's regional competitors are also looking to secure a bigger share of Asia's fast-growing market for polymers, although they are all at different stages in their downstream push.

Saudi Aramco is moving ahead with a number of plans, including signing up France's Total in early April to build a giant petrochemicals complex at its joint-venture refinery on the Gulf. The energy giant also restructured its board in April, appointing former executives from major chemicals producers, reflecting its strategic shift downstream.

Qatar Petroleum is also looking for partners for a new petrochemicals complex at Ras Laffan by 2025.



 The collapse of oil prices in 2014 highlighted the dangers of the region's reliance on crude exports

At 1.6 million tonnes a year, the Qatari ethane cracker would be the largest in the Middle East.

The biggest factor in favour of Middle East producers is access to cut-priced feedstock. This will be a key competitive advantage. As is government commitment to the projects, with a clear willingness to stump up the cash if needed, or tap into debt markets.

Adnoc has also shown a new commercial acumen with the part privatisation of its retail arm. This comes in the wake of a new approach championed by Al-Jaber, where the value of each barrel will be stretched to its limit, one analyst said.

ALGERIA

Algiers stakes future plans on new hydrocarbons law

- Average crude oil production (2017): 1.058 million b/d
- Average refinery intake (2017): 542,000 b/d
- Current refinery capacity: 35.6 million t/y
- Planned refinery expansion through upgrades: 46 million t/y

As Sonatrach seeks renewed international oil company investments, the state-owned oil firm is pinning its hopes on the government passing a long-awaited hydrocarbons law later this year — in order to tackle a number of issues, in particular Algeria's oil and gas tax regime.

Algiers passed its last hydrocarbons law in 2005. That was meant to open the country up to international investment by replacing Sonatrach's right to take a majority in all upstream partnerships, and reducing its stake to no more than 30 per cent.

But it met with considerable opposition in parliament, forcing a reversal just a year later. The mandated majority for Sonatrach has led to significant project delays due to the company's creaking bureaucracy and lack of cash. Later amendments, such as a windfall tax on profits, made investments even less attractive, and subsequent licensing rounds failed to bring in new companies.

As a result, Algeria has been left behind in an increasingly competitive market for international capital. Passing the law, according to Prime Minister Ahmed Ouyahia Kaddour, could attract \$53bn in capital investment in the upstream sector by 2021.

Downstream progress

While upstream investments flounder, Sonatrach has made progress on plans to upgrade its ageing downstream sector. As a major oil producer and Opec member, the fact that Algeria relies so heavily on fuel and refined product imports has always been a source of some embarrassment.

But Algeria has scaled back its plans to rapidly expand its domestic refineries, in response to lower oil prices,



dropping proposals to build five new 5 million tonne-a-year (t/y) refineries, and pushing ahead with only two new projects. Sonatrach issued a tender in November for the construction of a new deep-conversion refinery with a capacity of 5 million t/y, or 100,000 b/d, at Hassi Messaoud in the southeastern Ouargla Province.

This replaces an earlier plan for the construction of two 5 million t/y refineries at Hassi Messaoud and Tiaret in the northwest. The earlier tender has now been cancelled following a major downstream review.

Another tender for the construction of a 5 million t/y refinery at Tiaret will be launched in early 2018, Sonatrach CEO Abdelmoumen Ould Kaddour has said. When both are completed by 2021, the expansion will boost Algeria's total capacity to 35.95 million t/y.

Algeria's refining capacity stands at 30 million mt/y from six refineries – Algiers, Arzew, Skikda, both crude and condensate, Hassi-Messaoud and Adrar.

Sonatrach had previously announced a major downstream expansion programme to build five new refineries, of 5 million t/y each, to increase Algeria's total refining capacity and bring a halt to its costly diesel imports.

Project owner	Project	Budget (\$m)	Status	Planned completion
Sonatrach	Midstream pipeline network	6,270	Execution	2019
Sonatrach	Tinrhert gas field development	3,000	Execution	2022
Sonatrach	Tiaret export refinery	2,500	Main contract PQ	2021
Sonatrach	Hassi Messaoud refinery	2,500	Bid evaluation	2021
Groupeement TouatGaz	Touat natural gas field	2,000	Execution	2018

BAHRAIN

The Gulf's oil pioneer has announced its biggest find since 1932

- Average crude oil production (2017): 200,000 b/d
- Sitra refinery planned expanded capacity: 350,000 b/d
- Khaleej al-Bahrain shale oil reserves: 80 billion barrels
- Shale oil production target: 200,000 b/d

The Gulf's smallest oil and gas projects market received two significant boosts in the past year. In December, state-owned Bahrain Petroleum Company (Bapco) awarded a \$4.2bn contract to a joint venture of France's Technip and South Korea's Samsung Engineering for the long-planned expansion and modernisation of its 267,000 barrel-a-day (b/d) Sitra refinery.

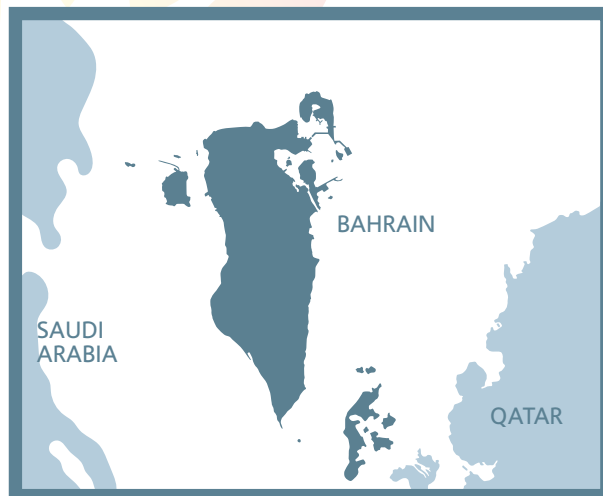
Bapco also announced a major new unconventional oil and gas find in May, its first major discovery for decades. The government hopes the find will dramatically change the island kingdom's fortunes.

The Sitra expansion is slated for completion in 2022, taking the refinery's total capacity to 360,000 b/d. It includes a new residue hydrocracking unit, hydrocracker, hydro-desulfurisation unit, crude distillation unit and vacuum distillation unit, among others.

The project has been planned for years, with Bapco finally issuing tenders for the engineering, procurement and construction of the project in May 2016. Bids were submitted in October. The expanded refinery will be supplied by a new 350,000 b/d crude oil pipeline from Saudi Arabia, which the government hopes will be completed at the end of 2018. It will replace the ageing 240,000 b/d line connecting Sitra with Saudi crude sources.

New discovery

While the refinery is being expanded, Bahrain will focus on plans to develop its new tight oil and deep gas discovery, which could hold more than 80 billion barrels of shale oil along with 20 trillion cubic feet of gas. The dis-



covery, in the 2,000 square-kilometre Khaleej al-Bahrain basin off the western coast, is the largest in the kingdom since 1932, dwarfing the Gulf state's current reserves, according to its Higher Committee for Natural Resources & Economic Security.

The Oil Ministry hopes to bring the gas onstream within five years with the help of oil field services giants Schlumberger and Halliburton. Bapco has started early talks with international oil companies to partner on the development, with a target of producing up to 200,000 b/d.

Analysts warn, however, that despite the attention-grabbing capacity estimates, actual production from the discovery could be considerably less. Realistic reserves could be in the 1-7 billion barrel range, according to consultants Wood Mackenzie. This would still be a significant boost to Bahrain, which is one of the oldest oil producers in the region, but also one of the smallest. At 200,000 b/d, the new field would almost match Bahrain's current output. It would also support extensive, long-term downstream activities, such as the Sitra expansion.

Project owner	Project	Budget (\$m)	Status	Planned completion
Bapco	Modernisation programme: refinery units	5,600	Execution	2022
Bapco	Modernisation programme	5,600	Execution	2021
Bahrain LNG	LNG import terminal	900	Execution	2019
National Oil & Gas Authority	LNG distribution centre	600	Study	2021
Banagas	Bahrain gas plant (BGP 3)	400	Execution	2018

EGYPT

New gas fields herald changes, but old problems persist

- Average crude oil production (2017): 627,000 b/d
- Refined product imports: 345,000 b/d
- Current refining capacity: 740,000 b/d

Since the discovery of the supergiant Zohr gas field, Cairo has been hopeful it can replicate the success with other giant offshore gas projects that have the potential to change the country's energy landscape.

Zohr is the biggest gas field discovered to date in the Mediterranean, with some 30 trillion cubic feet of reserves. Operated by Italy's Eni, Zohr started production in December 2017 – just 28 months after its discovery – and is now producing at about 1.1 billion cubic feet a day (cf/d).

The field has led a revival in Egyptian gas output, boosting production to 5.5 billion cf/d (6 billion cf/d later this year), and has changed the outlook for Egypt's gas sector. The country began importing liquefied natural gas in April 2015 to fill a growing supply-demand gap caused by a major slowdown in domestic gas development. Now Egypt can think about gas independence as early as this year.

Oil output

The country is a major non-Opec producer, with output averaging 627,000 barrels a day (b/d), according to the Riyadh-based Joint Organisations Data Initiative (JODI). Egypt's heavy oil is mostly processed by domestic refiners, while lighter oil from the Western Desert is often exported.

But Egypt still faces difficulties paying its international oil company partners. Cairo has always had a reputation for payment arrears, but the problem soared in the aftermath of the 2011 revolution due to the economic and political instability. Things got even worse with the collapse of oil prices in 2015, and the problem is not going away.

While major oil companies such as Shell and Apache can cope, Egypt's small producers are much more sensitive to oil



price movements, and have slashed investments with lower oil prices, causing their oil production to fall precipitously.

Egypt now has more than \$11bn-worth of refinery projects planned or underway, although most have suffered considerable delays due to financing difficulties.

One of the biggest projects is the expansion of the Midor refinery in Alexandria. The scheme will boost its crude processing capacity to 175,000 b/d from 115,000 b/d, with the addition of a hydrotreater, naphtha splitter and liquefied petroleum gas treatment units under a \$1.7bn contract with TechnipFMC. The expansion will increase the refinery's diesel capacity by 12,300 b/d to 70,000 b/d, and gasoline capacity by 11,900 b/d to 32,600 b/d, going some way to reduce Egypt's need to import the fuels. The country's ageing facilities are unable to cope with demand and it imported an average of 150,000 b/d of diesel and 90,000 b/d of gasoline in 2017, according to JODI.

The long overdue startup of the new Egyptian Refining Company hydrocracker near Cairo will add another 50,000 b/d of diesel and 12,000 b/d of gasoline.

Project owner	Project	Budget (\$m)	Status	Planned completion
BP/RWE Dea	West Nile Delta development: north Alexandria concession phase 1	12,000	Execution	2018
Egypt Ministry of Petroleum	Salamat field	10,200	Study	2023
Carbon Holdings	Tahrir integrated refinery and petrochemicals complex	6,650	Bid evaluation	2021
Egyptian Refining Company	Mostorod new refinery	4,100	Execution	2018
Burullus	West Delta deep marine development phase 9	4,000	Execution	2020

IRAN

Tehran is relying on Russia, China and possibly Europe to meet expansion plans

- Crude oil production capacity: 3.9 million b/d
- Refining capacity: 1.875 million b/d
- Investment required for planned oil and gas projects: \$200bn

US president Donald Trump's withdrawal from the Iran nuclear deal on May 8 has scuppered what little chance there was of Iran becoming a new beacon for energy investment in the region. Since the nuclear agreement was signed in 2015, the Islamic Republic has tried hard to attract international oil companies to commit to developing its vast oil and gas resources, but so far few have been able to turn the memorandums of understanding into real contracts.

Tehran was pinning its hopes on the EU in its efforts to skirt the new US sanctions. Europe is a key outlet for Iranian oil, taking about 700,000 barrels a day (b/d), or a third of its exports, but now its buyers have until 4 November to wind down their purchases before US sanctions kick in.

Most analysts surveyed by Platts expect an immediate impact of less than 200,000 b/d of Iranian crude shut in, rising to 500,000 b/d after six months as the deadline nears. But some say the disruption could be closer to 1 million b/d.

Upstream impact

In the longer term, it will also have a major impact on upstream development. A number of European companies have also signed agreements to help Iran develop its oil and gas sector. The biggest of these is France's Total, which agreed to spend billions of dollars developing a new phase of the giant South Pars offshore gas field. The companies are seeking waivers from the US, since the deals were signed before Trump pulled out of the deal, but there is little sign that Washington will oblige.

One of Iran's biggest upstream development plans is to boost crude oil production at the 155,000 b/d Azadegan field to as much as 750,000 b/d, a 500 per cent increase. A tender for the development of the field was originally



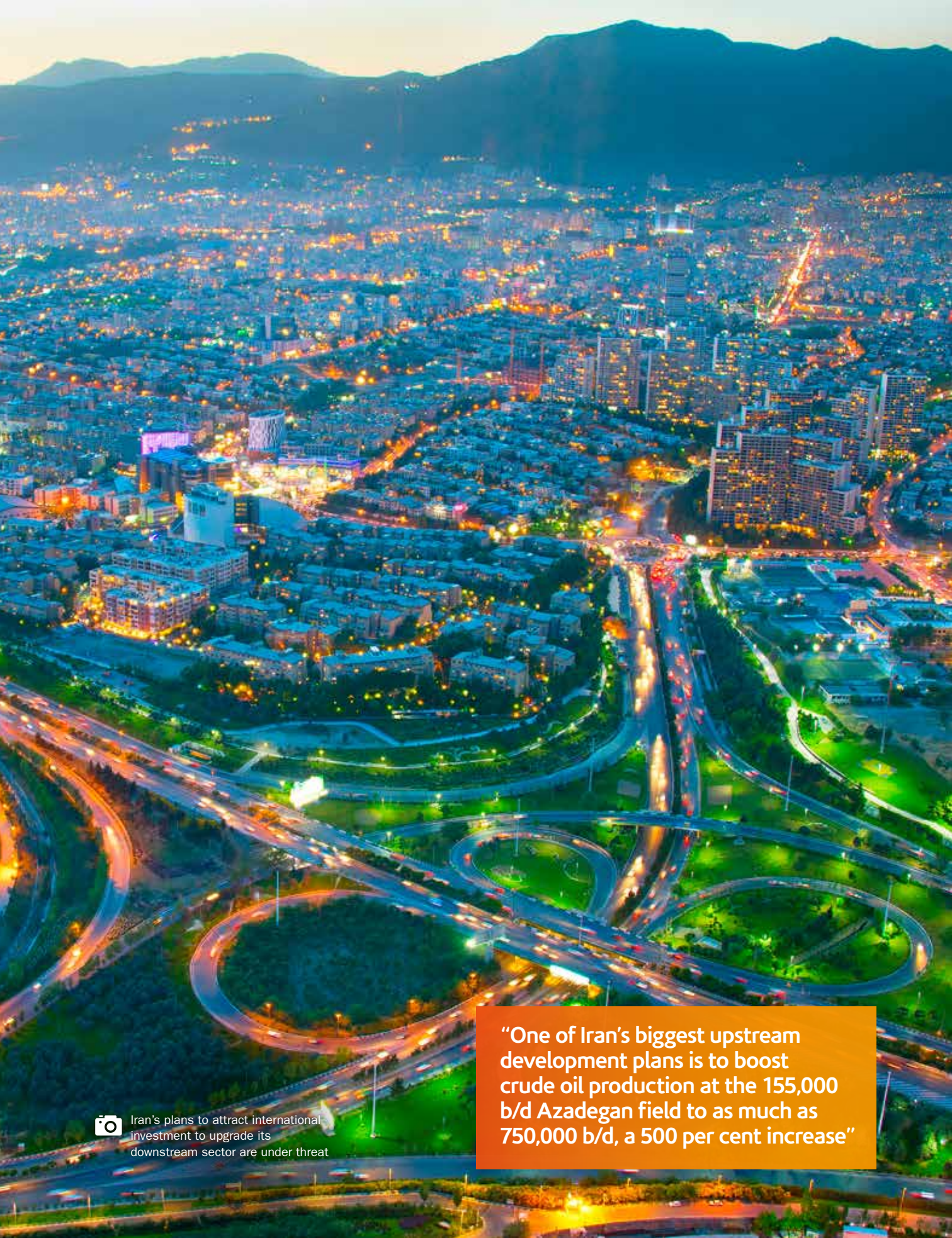
planned for last year, but Tehran delayed it to allow more oil companies to participate. China National Petroleum Corporation, Total, Shell and Inpex are among the oil companies that had been vying for its development.

The withdrawal of firms such as Total and Italy's Eni could leave Iran dependent on Russian and Chinese companies to help develop its oil and gas fields, but even these deals will bring in only a fraction of Iran's oil and gas investments needs, which the Oil Ministry puts at about \$200bn.

Iran's plans to attract international investment to upgrade its downstream sector are also under threat. South Korean contractor Daelim Industrial pulled out of a major deal to build new facilities at the Esfahan refinery in June, citing the return of US sanctions on the country. Daelim had been in contact with South Korean and overseas companies to finance the \$2bn project.

The Esfahan project was just one of a number of planned schemes to upgrade, rehabilitate and expand five of the refineries: Abadan, Bandar Abbas, Esfahan, Tabriz, and Tehran. Four new refineries are also planned, including Anahita, a 150,000 b/d plant, which will cost an estimated \$4 billion. It is unlikely any will now be built in the near term.

Project owner	Project	Budget (\$m)	Status	Planned completion
Pars Oil & Gas Company	South Pars gas field development	91,000	Execution	2023
Iranian Gas Engineering & Development Co.	IGAT gas trunkline	17,863	Execution	2021
Pars Oil & Gas Company	North Pars gas field development	16,000	Study	2023
Pars Oil & Gas Company	North Pars gas field development: onshore	10,000	Study	2023
Iran Liquefied Natural Gas Company	Iran LNG project	8,480	Execution	2019



Iran's plans to attract international investment to upgrade its downstream sector are under threat

"One of Iran's biggest upstream development plans is to boost crude oil production at the 155,000 b/d Azadegan field to as much as 750,000 b/d, a 500 per cent increase"

IRAQ

Opec's second-biggest oil producer is unlikely to fulfil its promise

- Average crude oil production (2017): 4.4 million b/d
- Planned crude production capacity by 2022 (excluding KRG): 6.5 million b/d
- Average refinery intake (2017): 533,000 b/d
- Planned refinery expansion: 1.5 million b/d

Baghdad plans to boost production capacity to 6.5 million barrels a day (b/d) by 2022, up from about 5 million b/d now. This includes capacity in the semi-autonomous Kurdistan region of northern Iraq, where the regional government hopes to double its current 350,000 b/d production over the coming 12 months.

But its use of technical service contracts has scared off many international oil companies (IOCs), while others have been trying to negotiate new terms with the Oil Ministry.

Under Iraq's 2009 bid rounds, fields were awarded to international oil companies on the basis of a per-barrel remuneration fee and plateau production targets. Critics of the bid rounds said the plateau production targets led to IOCs promising unrealistic targets for fields.

Iraq has pressed international contractors to increase output capacity. They obliged after the government settled its arrears with the sector in early 2017 and the subsequent prompt payment of dues, helped by oil prices that have risen almost 75 per cent in the past year.

Treated seawater

Key to reaching the longer-term targets is the common seawater supply facility, which will provide about 5 million b/d of treated water for injection into some of Iraq's massive southern oil fields to support reservoir pressure and extraction.

In development for more than seven years, the multi-billion-dollar project was meant to be up and running by now, but disputes between the Oil Ministry and its oil company developers have meant it has not even got off the drawing board.



Even though state-owned Basra Oil Company says it has a shortlist of three companies, it is hard to see a contract being awarded soon. And it is unlikely to be ready before 2022, which will affect the rate at which some major southern fields, such as West Qurna 1 and 2, Rumaila north and Zubair, can raise production.

Export terminal

Iraq also has several critical infrastructure projects that will need to fall into place. The country's current maximum southern export capacity is 3.7 million b/d, leaving little room for increases. Boosting upstream production, without the domestic refinery or export capacity to match it, will be a waste of money.

This makes the completion of the Al-Faw storage and export terminal critical. An additional 16 storage tanks of 58,000 cubic metres each and 10 units for the main gas turbine-driven pump house are still needed to help get Iraq's crude to loading terminals for shipment. The terminal is years behind schedule and without completion, southern export capacity will not rise further.

Project owner	Project	Budget (\$m)	Status	Planned completion
Ministry of Oil	Iraq strategic crude oil export pipeline	27,500	Execution	2022
Eni/Oxy/Kogas/MOC	Zubair field development	20,000	Execution	2028
Basrah Gas Company	South Gas utilisation project	17,200	Execution	2019
Ministry of Oil	Nasiriya integrated project	12,000	Main contract PQ	2025
PetroChina/SOC/Petronas/Total	Halfaya project surface facility	10,000	Execution	2020

KUWAIT

Kuwait is sticking to its spending commitments, albeit slowly

- Oil production capacity: 3.2 million b/d
- Planned oil production capacity by 2020: 4 million b/d
- Refinery capacity: 736,000 b/d
- Planned refinery capacity by 2022: 1.4 million b/d
- Al-Zour refinery (under construction): 615,000 b/d

Kuwait's Oil Ministry hopes to shrug off its reputation for delays to major projects, after unveiling spending of more than \$100bn on the oil sector in the next five years to boost production capacity by 20 per cent.

State-owned Kuwait Petroleum Corporation (KPC) launched a huge spending plan earlier this year — more than 70 per cent earmarked for the upstream oil sector — to help Kuwait hit its 4 million barrels a day (b/d) target for crude oil production capacity by 2020, up from about 3.2 million b/d currently. Some 3.65 million b/d of this additional capacity will come from Kuwait Oil Company; the remainder from Kuwait's portion of the partitioned Neutral Zone that it shares with Saudi Arabia.

These plans have long been held by Kuwait, and many analysts doubt whether the Gulf state will meet this deadline, given that it has been pushed back repeatedly.

Refinery upgrades

Alongside this upstream expansion, KPC's 2040 strategy sets out plans for Kuwait to build out its downstream sector, with a planned capacity of 2 million b/d by 2035, up from 936,000 b/d currently. Work is already well under way on the massive clean fuels project to modernise and expand Kuwait's three existing refineries by next year. KPC has also started work on the long-delayed 615,000 b/d Al-Zour refinery, which will boost its refined product exports and provide fuel oil for power generation. When complete in 2020, it will take capacity to 1.4 million b/d.

Alongside Al-Zour, Kuwait plans to build a new integrated petrochemicals facility, known as the olefins-3 project, which will entirely use liquid feedstock from the



refinery. Another as yet unspecified refinery is also in the works for 2035, as well as 1 million b/d of joint-venture refining capacity to be built outside of Kuwait.

The Gulf state already has significant overseas refining assets, operated by Kuwait Petroleum International, a KPC subsidiary. These include the 268,000 b/d Milazzo refinery in Sicily, a joint venture with Eni, and Vietnam's new 200,000 b/d Nghi Son refinery, which commenced operations in April 2018. Kuwait is also working with neighbouring Oman to build another 230,000 b/d refinery at Duqm in a rare example of intra-Gulf cooperation.

“Along with the upstream expansion, Kuwait's 2040 strategy sets out plans to build out its downstream sector, with a planned capacity of 2 million b/d by 2035, from 936,000 b/d currently”

Project owner	Project	Budget (\$m)	Status	Planned completion
Kuwait Integrated Petroleum Industries Co.	New refinery project	17,000	Execution	2021
Kuwait National Petroleum Company	Clean fuels project 2020	16,285	Execution	2022
Kuwait Oil Company	Ratqa Lower Fars heavy oil handling facilities	9,000	Execution	2030
Kuwait National Petroleum Company	Clean fuels project 2020: MAB package 1	5,300	Execution	2018
Kuwait National Petroleum Company	Clean fuels project 2020: MAB package 2	5,300	Execution	2018

OMAN

The development of two huge gas fields has changed the sultanate's gas fortunes

- Duqm refinery capacity: 230,000 b/d
- Ras Merkaz crude oil storage terminal phase 1: 8 million barrels
- Ras Merkaz crude oil storage terminal planned total: 200 million barrels

Just two years ago, Muscat was seriously thinking about cutting its liquefied natural gas (LNG) production to meet rising domestic gas demand. Now, it faces the opposite dilemma, with the development of two massive gas fields forcing a major strategic rethink in the sultanate's upstream sector.

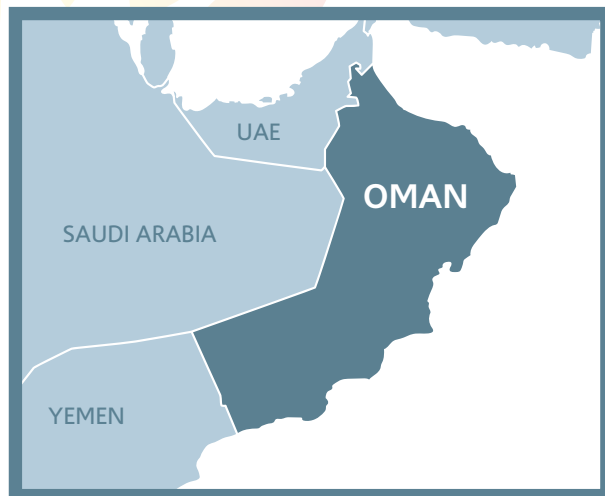
One of its key decisions will be whether to proceed with the development of the Mabrouk gas field. Petroleum Development Oman (PDO) — one of the country's largest producers — has completed the appraisal of the field, but is waiting for approval from the Ministry of Oil & Gas before pushing ahead with development.

Estimated reserves

PDO's conservative estimates at the field, located in the Gharif formation in northern Oman, put gas reserves at 4.4 trillion cubic feet, along with 110 million barrels of condensates. This would rival BP's massive Khazzan field, which will drive its industrial diversification plans.

Once considered a non-commercial project, the question for Mabrouk now is whether Oman needs the new gas immediately, given that it is currently enjoying a surplus for at least the next five years.

BP started production at the \$16bn Khazzan field last September, and has ramped up output to 1 billion cubic feet a day (cf/d), equal to a third of Oman's gas needs. BP awarded an \$800m contract to Petrofac in December for the engineering, procurement and construction of a second central processing facility at Khazzan. This will boost output to 1.5 billion cf/d, which would be equivalent to 40 per cent of Oman's domestic gas requirements,



and would allow incremental LNG exports of 1.5 million tonnes a year (t/y) from the country's plants.

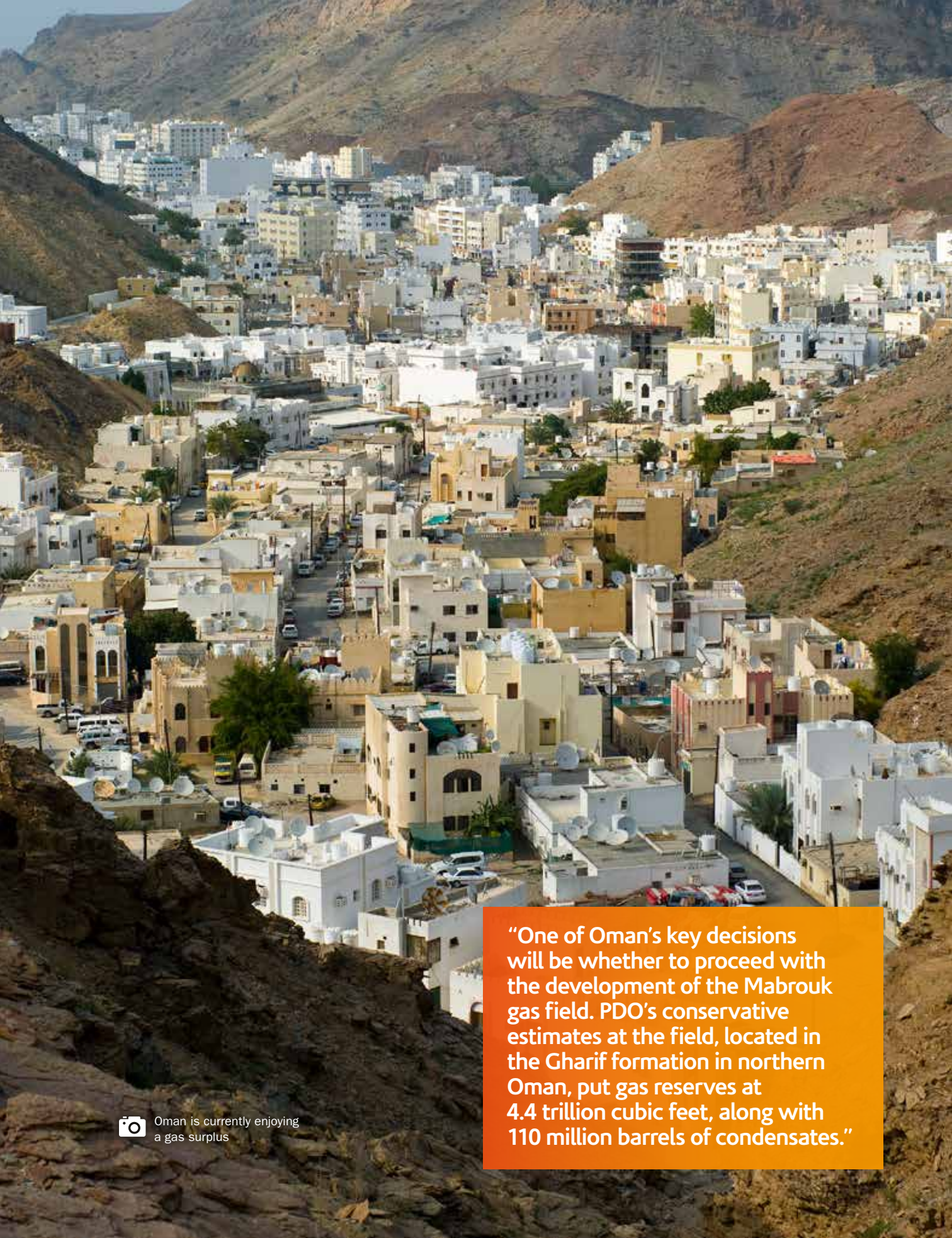
Oman exported a four-year-high 8.24 million tonnes in 2017, but even with expanding gas production, it has no plans at present for the construction of a fourth LNG train for export.

LNG bunkering

Instead, some of the gas will be used by Oman in partnership with Total to develop a regional hub for LNG bunkering services. This will use a small-scale modular liquefaction plant of just 1 million t/y at the port of Sohar in northern Oman.

The International Maritime Organisation's 2020 ban on high-sulfur fuel oil as a marine fuel will help the LNG bunkering business, and as with the UAE's Fujairah port, Sohar is strategically located outside of the Strait of Hormuz. However, there is little immediate prospect of Sohar overtaking Fujairah as a conventional bunkering hub.

Project owner	Project	Budget (\$m)	Status	Planned completion
BP	Block 61 development	16,000	Execution	2020
Duqm Refinery	Duqm refinery and petrochemicals complex	16,000	Execution	2023
Duqm Refinery	Duqm Refinery	7,000	Execution	2021
Oman Wanfang	Refinery in Duqm	5,650	Study	2025
Petroleum Development Oman	Habhab field service contract	5,000	Study	2022
South Asia Gas Enterprise	Middle East to India deepwater pipeline	4,500	Study	2024



Oman is currently enjoying
a gas surplus

"One of Oman's key decisions will be whether to proceed with the development of the Mabrouk gas field. PDO's conservative estimates at the field, located in the Gharif formation in northern Oman, put gas reserves at 4.4 trillion cubic feet, along with 110 million barrels of condensates."

QATAR

Doha may be regionally isolated, but it still has grand ambitions

- LNG production capacity: 77 million t/y
- Planned LNG production capacity by 2023: 100 million t/y
- Crude oil production (2017): 599,000 b/d

Already the world's largest shipper of liquefied natural gas (LNG), Qatar is pushing ahead with ambitious plans to increase its global dominance, despite the economic blockade by some of its Gulf neighbours.

The peninsula state's main resource is the North Dome gas field, the world's largest single non-associated gas field, which holds an estimated 900 trillion cubic feet.

Until it was lifted in April 2017, Qatar had imposed a strict moratorium on its further development for most of the past decade.

Last summer, less than a month after the ongoing Saudi-led embargo began, Doha announced plans to boost its LNG production capacity by about 30 per cent to 100 million tonnes a year (t/y) over the next five to seven years, up from 77 million t/y currently. Two designs contracts have already been awarded for new offshore facilities and new onshore LNG production trains.

Petrochemicals footprint

The expansion will not only boost Qatar's LNG market share; it will also provide considerable ethane feedstock for Qatar Petroleum's plans to boost its petrochemicals footprint. The state-owned company announced plans in May to build a new complex at Ras Laffan, and invited international companies to submit joint venture proposals.

Slated for completion in 2025, the planned complex will include an ethane cracker with a capacity to produce 1.6 million t/y of ethylene — the largest in the Middle East — along with derivative plants. The engineering design for the new complex should commence shortly.

Qatar's energy industry has succeeded in weathering the ongoing blockade, and its officials point to the fact



“Last summer, less than a month after the ongoing Saudi-led embargo began, Doha announced plans to boost its liquefied natural gas production capacity by about 30 per cent to 100 million t/y in the next five to seven years, up from 77 million t/y currently. Two designs contracts have already been awarded for new offshore facilities and new onshore LNG production trains.”

that not a single cargo of oil or LNG has been delayed. Nevertheless, potential investors in its LNG expansion will have to carefully weigh the risks of their exposure if the blockade continues in the long term.

Project owner	Project	Budget (\$m)	Status	Planned completion
QP	Bul Hanine field redevelopment project	11,000	Execution	2021
QatarGas	Barzan gas development	10,300	Execution	2023
QP	Bul Hanine field redevelopment project: phase 1	7,000	Execution	2022
Qatargas	North Field gas development	3,000	Feed	2022
Oxy	Idd el-Shargi North Dome expansion: phase 5	750	Bid evaluation	2020



SAUDI ARABIA

Aramco is planning a downstream expansion to capture crude demand

- Crude oil production capacity: 12.5 million b/d
- Average crude oil production (2017): 9.96 million b/d
- Saudi Aramco's global refinery capacity: 5.4 million b/d
- Planned global refining capacity: 8-10 million b/d

As it presses ahead with plans for an initial public offering, Saudi Aramco's revamp of its board of directors is a sure sign of how the state energy giant views its future. The new board, appointed in May, includes former senior executives from international oil and chemicals companies and points to a new focus on downstream.

The new members include former Chevron Phillips Chemical Company CEO Peter Cella, former chair and CEO of Sunoco Incorporated Lynn Laverty Elsenhans, and Dow Chemical Company CEO Andrew Liveris. Dow is notably also a partner with Aramco in the Sadara Chemical Company, a \$20bn plant on the Gulf coast at Jubail.

The combined experience of these new members will be invaluable as Aramco seeks to raise its global refining capacity to 8-10 million barrels a day (b/d), up from its present 5.4 million b/d, as part of its plans to ensure a captive market for its crude. The company has also been driving downstream integration through new refineries and petrochemicals plants in key demand growth areas, or with cheap feedstock, in order to cement its role as a major product exporter in the coming decades.

In April, the energy giant signed an initial deal to jointly develop a giant \$44bn refinery and petrochemicals complex on India's west coast, and is also eyeing the US petrochemicals market with plans for a complex at the 603,000 b/d Port Arthur refinery in Texas. Domestically, it has also signed a \$5bn agreement with Total to build a new integrated petrochemicals complex at Jubail.

Crude to chemicals

Aramco has allocated \$20bn for the development of a crude-to-chemicals plant by 2025 in a joint venture with Saudi Basic Industries Corporation. The 400,000 b/d facility will convert crude oil directly to petrochemicals — bypassing the refining process in a first for the region.

Of course, the downstream expansion is heavily dependent on Aramco's ability to maintain its massive crude oil production capacity of some 12 million b/d. Despite the fall in oil prices, Aramco is continuing to pump money into upstream developments.



Aramco has embarked on an ambitious spending plan of \$414bn for the next 10 years as the state-owned oil giant seeks to maintain its oil production capacity and boost its natural gas supplies. Nearly half the spending plan will focus on an aggressive drilling programme to grow its reserves.

Replacing facilities

The latest contract signed by Aramco was with US engineers McDermott for the building of facilities worth more than \$750m at the 1.5 million b/d offshore Safaniya field, the largest producing offshore field in the world. The brownfield project is part of Aramco's campaign to replace ageing facilities to enhance output and increase offshore production levels by 1 million b/d by 2023 in order to compensate for production declines at its older onshore fields. The giant Ghawar field, for example, has been Saudi Arabia's workhorse for more than 60 years.

The contract follows a major deal signed with Italy's Saipem for 19 new platform jackets at the Marjan, Zuluf, Berri, Hasbah and Safaniya offshore oil fields.

Amec Foster Wheeler is currently designing new facilities at the 270,000 b/d Marjan field, which will deliver an additional 300,000 b/d oil-gas separation train.

At Zuluf, Aramco signed a project management contract with Jacobs Engineering for facilities to process 600,000 b/d of Arab heavy crude. The deal includes water injection and oil wellhead platforms, along with an on-shore central processing facility.

For all its oil wealth, the kingdom has a relatively weak domestic gas market and instead relies on massive



Saudi Arabia aims to raise its global refining capacity to 8-10 million barrels a day

Project owner	Project	Budget (\$m)	Status	Planned completion
Saudi Aramco	Jizan refinery project	16,165	Execution	2018
Saudi Aramco	Marjan field development	7,000	Execution	2022
Saudi Aramco	Arabiyah-Hasbah development programme	6,600	Execution	2019
Saudi Aramco	Fadhili gas plant	6,500	Execution	2019
Saudi Aramco	Hawiyah gas plant expansion and Haradh gas compression plants	6,500	Execution	2021

quantities of crude and fuel oil for power generation, especially in the sweltering summer months. It burned an average of 458,000 b/d of crude last year, according to the Riyadh-based Joint Organisations Data Initiative — barrels that could have been exported.

The country processed an all-time high of 12 billion cubic feet a day (cf/d) of raw gas in 2016, producing 8.3 billion cf/d of sales gas, up from about 8 billion cf/d of sales gas in 2015, according to its annual review last June.

Gas plants

Aramco is nevertheless building several massive gas processing plants, and in the longer term hopes to move into unconventional resources. It signed a contract with oil field services giant Halliburton in June for unconventional gas stimulation services. The contract includes major hydraulic fracturing and well intervention operations in

three areas of the kingdom — North Arabia, South Ghawar in the Eastern Province and the Jafurah basin in the Rub al-Khali (Empty Quarter) in the southeast.

Saudi Arabia holds the world's fifth-largest gas reserves, with more than 300 trillion cubic feet, according to the US Energy Information Administration. But the sector remains underdeveloped, largely as a result of generous energy subsidies that have kept domestic gas prices artificially low.

Questions also remain as to whether the unconventional gas resources are recoverable at a low enough cost to make production viable.

Liquid fuels continue to account for half of the current energy mix. The government hopes to increase the share of gas used to 70 per cent over the next 10 years, nearly doubling its current gas production to 23 billion cf/d by 2026.

UAE

Abu Dhabi plans to transform Ruwais into a downstream hub

- Crude oil production capacity by 2019: 3.5 million b/d
- Ruwais refinery capacity: 840,000 b/d
- Planned capacity expansion by 2025: 1.44 million b/d
- Refinery and petrochemicals planned spending: \$45bn

Abu Dhabi National Oil Company (Adnoc) wants to turn Ruwais, a small industrial town in the UAE's western region on the Gulf coast, into a refining, petrochemicals and conversion hub, and is willing to spend more than \$45bn to make the downstream silicon oasis happen.

Before it embarks on this megaproject, potentially with the help of some big name international partners, Adnoc has a number of other schemes planned for Ruwais.

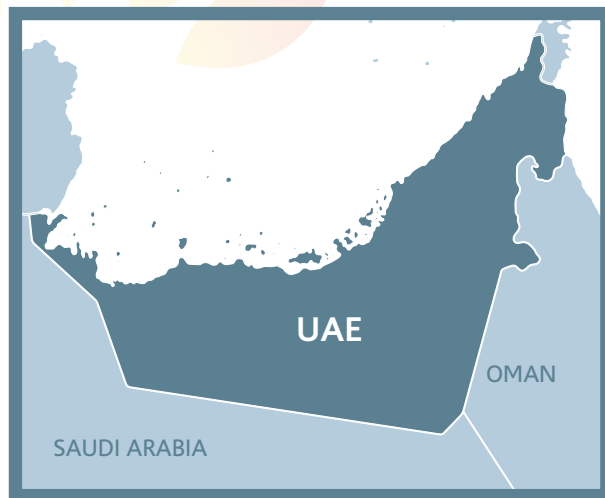
In early June, Adnoc released a long-awaited tender for a major new project to boost gasoline and aromatics production from the Ruwais refinery. The project will expand existing gasoline production units at Ruwais, boosting gasoline production to 9.4 million tonnes a year (t/y) by 2022, up from 5.2 million t/y currently.

This is together with the construction of a new complex to produce 1.56 million t/y of paraxylene and benzene. Bids for both are due in November, and construction is expected to be completed around 2024.

Downstream expansion

The project is the latest in Adnoc's ambitious plan to expand its downstream sector. The 840,000 barrel-a-day (b/d) Ruwais refinery was expanded in early 2015, after a massive project to double its capacity. It was hit by a major fire in January 2017, which resulted in its RFCC unit being shut down. Major repairs are under way and Adnoc hopes work will be completed by the middle of 2018.

Adnoc awarded a \$3.1bn contract to Samsung Engineering earlier this year for a major upgrade of the existing Ruwais refinery-west, which will allow it to process offshore crude, freeing up as much as 420,000 b/d of its flagship Murban crude for export.



Until now, Ruwais has exclusively processed on-shore Murban crude. With a density of 39.6 API degrees, compared to 34 degrees for the heavier Upper Zakum grade, Murban commands a higher price on global oil markets.

One of the side effects of the expansion to include units to process offshore crudes is that, by 2022, Abu Dhabi could actually begin importing crude oil for the first time in the emirate's history. It had originally planned for the revamped refinery to process up to 420,000 b/d of Upper Zakum crude, but will consider importing similar crude grades if the price is right.

Refining capacity

Adnoc's longer-term plans include boosting its total refining capacity from 922,000 b/d currently — with 650,000 b/d of crude and the rest condensates — to ensure fuel self-sufficiency, as well as growing its petrochemicals portfolio. It plans to build a new 600,000 b/d refinery next to the giant Ruwais complex, taking the total to more than 1.2 million b/d.

Project owner	Project	Budget (\$m)	Status	Planned completion
Adnoc Offshore	Upper Zakum full-field development	16,180	Execution	2020
Adnoc Refining	New refinery	15,000	Study	2021
Adnoc Sour Gas	Hail and Ghasha sour gas development	15,000	Main contract bid	2021
Adnoc	Bab sour gas project	10,000	Study	2021
Adnoc Sour Gas	Shah gas development	9,100	Execution	2021



“Before Adnoc embarks on the Ruwais megaproject, potentially with the help of some big name international oil company partners, the firm has a number of other schemes planned for the town”

KEY POLICY TRENDS

Gulf nations are at various stages of national drives to diversify their economies

The sea change heralded by the transformations taking place in the global energy market and industry is having equally transformative effects on producing countries, particularly those in the Middle East – who hold nearly half of the world's oil reserves and whose economies and national security are so dependent on oil and gas production.

The Washington-based IMF has long suggested that drastic reforms are needed among the oil-exporting nations in the Middle East to address issues of social inclusion, job creation and sustainable growth.

In its latest Regional Economic Outlook in May, the IMF says 2017 saw economic growth in GCC countries decline sharply, along with other producing states in the region, due to low oil prices. Saudi Arabia, the biggest Arab economy, saw its economy shrink for the first time since the global downturn in 2009.

“Each \$10 reduction in the price of oil lead to an instantaneous deterioration of three percentage points of GDP in the fiscal balance of Menap (Middle East, North Africa, Afghanistan and Pakistan) oil exporters (excluding Libya and Yemen),” the IMF warned in its outlook.

Economic diversification

The Gulf countries are at various stages of national drives to diversify their economies in addition to ploughing their massive fossil-fuel derived fortunes into overseas ventures in a bid to grow their ‘rainy day’ savings through lucrative investments. This includes buying up shares in major car companies and real estate in prized locations.

Efforts to seek longer-term sustainable methods to shore up their economies have accelerated since oil prices tumbled in 2014.

To bridge the divide between the immediate pressing needs of economic development and longer-term objectives, major producers such as Saudi Arabia and Abu Dhabi are either in the advanced stages of going public with segments of their national oil companies, or have already done so.

The Gulf region's centralised monarchical governments and their nationalised and semi-nationalised entities are in the middle of efforts to redistribute their oil and gas wealth and develop homegrown industries and supply chains for goods and services in order to create wide-spread jobs programmes for their citizens.

Currently, much of the economic diversification being sought in the region emanates from developing and find-



The region's governments are taking a maturer approach to achieving greater energy security and economic stability

ing new hydrocarbon products to produce and markets to sell them to. Nearly all the major producers in the region either have existing billion-dollar refining and petrochemicals projects undergoing expansion or new infrastructure under construction.

Nevertheless, for the first time, a strategic shift towards cleaner and renewable energy sources is also under way, in a signal of a maturing outlook for the region's governments towards achieving greater energy security and economic stability moving forward.



“The Gulf region’s centralised monarchical governments and their nationalised and semi-nationalised entities are in the middle of efforts to redistribute their oil and gas wealth and develop homegrown industries and supply chains for goods and services in order to create widespread jobs programmes for their citizens.”

Foreign companies that wish to do business in these countries are now being incentivised to invest in local capital and research and development programmes. They are also being encouraged to employ new processes and technologies to drive greater efficiency.

A prime example of a company straddling and meeting the various parts of these national growth agendas is GlassPoint, a California-based solar-powered steam producer that has partnered with the national oil companies of Oman and Kuwait to improve yields from heavy oil

fields in both countries. The company has combined its technological expertise in pumping solar-powered steam into heavy oil wells in Kuwait’s Ratqa Lower Fars field on its border with Iraq to produce 270,000 barrels a day (b/d) — as part of Kuwait’s target of achieving 4 million b/d production capacity by 2030.

In doing so, the company has been able to reduce the vast amounts of natural gas, together with the associated carbon emissions, that would otherwise be used as part of the enhanced oil recovery (EOR) process.

Local suppliers

Glasspoint is also working closely with suppliers in Oman — where it first broke ground in the Gulf — to qualify local companies for its Miraah major heavy oil extraction project, which uses large aluminium structures to support an array of curved mirrors used for steam generation.

In addition to offering solar-powered steam technology, the company is trialling solar plants to be integrated into oil field operations, a welcome possibility for regional oil and gas producers seeking to reduce operational costs, reduce their natural gas usage, and increase output for both export and to meet increasing domestic demand.

Given that more than half of the world’s remaining reserves consist of heavy oil deposits requiring thermal EOR or steam injection to produce — and that this process accounts for 90 per cent of the energy consumed on these particular projects — partnerships such as those between GlassPoint and national oil companies in the Gulf will be critical to future regional economic development.

PRIVATE SECTOR PARTICIPATION

Saudi Aramco and the UAE's Adnoc are driving privatisation plans

While Saudi Arabia's plans to partly privatise Aramco through an initial public offering (IPO) have dominated the region's news agenda, less attention has been paid Abu Dhabi's already effected efforts to transform its state oil company into a more commercially driven entity.

Last December, Adnoc listed 10 per cent of its newly created shares in Adnoc Distribution, a wholly owned downstream retail business, on the Abu Dhabi Securities Exchange. The final investor allocations were approximately 90 per cent for qualified investors (split 60 per cent local and 30 per cent international) and 10 per cent for individual and other investors, giving it a market capitalisation of approximately \$8.5bn.

Major shake-up

The IPO is the first part of a shake-up of its flagship national oil company, which pumps 3 million barrels a day (b/d) of crude oil, and can refine more than 900,000 b/d.

Adnoc has made it abundantly clear, however, that despite the Adnoc Distribution listing, it will not consider privatising the Adnoc holding company, which will remain wholly owned by the Abu Dhabi government.

Since the IPO of a retail business is on a much smaller scale than Aramco's ambitious sale of its holding entity, it is clear Adnoc will not be following a similar path.

"Riyadh is not interested in a stake which could be valued at \$60bn plus. They want to sell much more than that to invest in the local economy to have additional money in the Public Investment Fund to support strategic sectors. The downstream assets by themselves don't create that cash ... You create demand for Aramco's upstream by keeping it tied to the downstream."

– Senior banking source in Riyadh

Indeed, the objectives are not the same. Adnoc does not appear particularly interested in generating cash from the IPO. Under the leadership of CEO Sultan al-Jaber, it is much more concerned with changing the company's operating culture. The stated idea behind the part-privatisation was to allow Adnoc to better manage its capital and portfolio of assets, and expand its range of new and existing partnerships — from upstream through to downstream.

Some analysts have also speculated that Aramco could pursue a strategy of incrementally listing some of its downstream assets. A precedent is already in place in the form of PetroRabigh — the Saudi Aramco/Sumitomo Chemical refinery and petrochemicals complex, which was formed in 2005 and listed in 2008 on the Tadawul. As a result of the listing, the ownership of shares held by Saudi Aramco and Sumitomo Chemical was diluted to 37.5 per cent each.

The problem here is that downstream assets will not create enough cash for Saudi Arabia's economic investment and diversification plans.

"Riyadh is not interested in a stake which could be valued at \$60bn plus. They want to sell much more than that to invest in the local economy to have additional money in the Public Investment Fund to support strategic sectors. The downstream assets by themselves don't create that cash," said a senior banking source in Riyadh.

Splitting the assets would also make little economic sense when the integrated upstream/downstream chain creates more value. "You create demand for Aramco's upstream by keeping it tied to the downstream," the source said.

IPO fanfare

Crown Prince Mohammed bin Salman (MBS), along with his key executors – Energy Minister Khalid al-Falih and CEO Amin Nasser – have all staked their reputations on the Aramco IPO plan. In the case of Al-Falih and Nasser it is not clear how much input they have in the decision or if they are simply going along with the crown prince. But they have doubled down and insisted that it is progressing to the original schedule. For MBS, who could well be king, the IPO is a key symbol of the public's trust. Explaining the failure of the IPO after all the fanfare would not be easy.

The reality is that the kingdom has not yet answered internally what kind of company it wants Aramco to be, and until it can do that, and justify the initial valuations offered, it remains unknown how it will move forward.



ABOUT MEED

Established in 1957, MEED has been delivering business information news, intelligence and analysis on the Middle East economies and activities ever since.

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Established in 1967, Mashreq is the oldest bank in the UAE, with award-winning financial solutions and services. Throughout its 50 years' history, Mashreq has differentiated itself through innovative financial solutions, making it possible for its customers to achieve their aspirations.

Today, Mashreq has a significant presence in 11 countries outside the UAE, with 21 overseas branches and offices across Europe, the US, Asia and Africa.

Mashreq launched its new Vision and Mission recently, outlining its commitment towards its clients, colleagues and the community. In line with its vision to be the region's most progressive bank, Mashreq leverages its leadership position in the banking industry to enable innovative possibilities and solutions for its customers across corporate, retail, international, treasury and Islamic banking.

Mashreq is proud to be the first financial institution in the UAE to be awarded the Gallup Great Workplace Award for four consecutive years from 2014-17. Mashreq also continues to invest in recruiting, training and developing future generations of UAE national bankers.

