



Abouzar production platform, the largest Iranian oil production complex in the Gulf. Photo courtesy of National Iranian Oil Co.

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Hassan Rouhani and Barack Obama phone call could thaw relations and lead to a major shift in energy markets

By Robin Mills

Friday's phone call between the Iranian president Hassan Rouhani and Barack Obama – the highest level contact for three decades - made headlines.

It might turn out to be no more than another of several false dawns during the long cold war between Iran and the United States. Or it could be the opening for a diplomatic breakthrough and a major shift in energy markets.

Resolution of the dispute over Iran's nuclear programme could open the way to normalisation of relations between the US and the Islamic Republic. There is still a long and winding path to that goal – it could be derailed by hardliners on either side, or by the inevitable pressure of turbulent events, in Syria or elsewhere. But even a relaxation of sanctions could allow Iran to regain its role as a leading oil and gas player.

The new oil minister, Bijan Zanganeh, previously held the post from 1997 to 2005. His first tenure was regarded as a golden age by the Iranian oil industry and international companies. It certainly was, by comparison with the Ahmadinejad era that followed. But viewed objectively, it was only a partial success. Oil production increased from 3.8 million barrels per day to 4.2 million bpd, and gas output more than doubled. Major contracts were signed with Total, Shell, Statoil and Russia's Gazprom.

But major strategic goals were not met. Other than Turkey, Iran did not become a gas exporter to its neighbours, which would have built its regional influence. It

did not develop LNG exports despite exhaustive negotiations. The reformist camp around Mohammad Khatami, a former president, was consumed in debate over whether gas should be exported, used in industrial development or to increase oil production. As a result, they achieved none of those things. Domestic consumption soared because of profligate subsidies. And new oil developments dried up as international companies became frustrated with the unattractive “buy-back” terms.

As long as sanctions persist, Iran can do no more than nibble around the edges, search for loopholes and try to implement a war economy.

But given a deal on the nuclear issue, Mr Zanganeh’s announced strategy for his second period in office is sensible – to expand gas-based industries at home, develop new gas exports, restore oil production to pre-sanctions levels, and develop cross-border fields shared with Iran’s neighbours in the Gulf, Iraq and the Caspian Sea. He would have to attract back experts from the Iranian diaspora, sidestep bureaucracy and politicised decision-making – and convince oil majors that Iran was truly open for business.

The return of Iran as a global energy player would mean several things. Instead of one OPEC heavyweight – Saudi Arabia – as there has been over the past decade, there would be three, with Iraq and Iran joining the Saudis.

Iran’s subsidy reform programme was derailed from a promising start by politicisation, inflation and the collapse of the rial under sanctions pressure. It would have to be revived to control domestic demand and free up gas for export.

But then Iran could expand supplies to Turkey – desperate to diversify away from Russia – and on to Europe. Gas could also flow to energy-starved Pakistan, and perhaps some of Iran’s GCC neighbours such as Oman. Given access to international technology, it could become a player in the crowded global LNG market by the early 2020s, with very competitive costs, second only to Qatar.

Russia would be the biggest loser from this realignment: not only will it lower prices for its oil, but also competition for its premier gas markets in Europe. China, India and the EU would be among the winners. The stars are briefly aligned: the phone call may disappoint – or set global energy on a new path.

A version of this article appeared in The National newspaper on September 22nd, 2013

Benchmark Oman crude retreats from 2013 highs

By Paul Young (DME)

Oman crude oil trading on the Dubai Mercantile Exchange in September retreated from the 2013 highs set during August, but held comfortably above the

psychologically important \$100/barrel level, as a voracious appetite for Middle East crude in the first half of the month underpinned prices.

The front-month November contract expired on Monday at \$105.44, the lowest settlement for seven weeks and down around \$5.50/b on the month, or 5%.

Oman crude briefly reached a one-year high of just over \$115.00/b in late August, as geopolitical tensions regarding Syria and production losses from Libya, Nigeria, and the North Sea pushed prices higher.

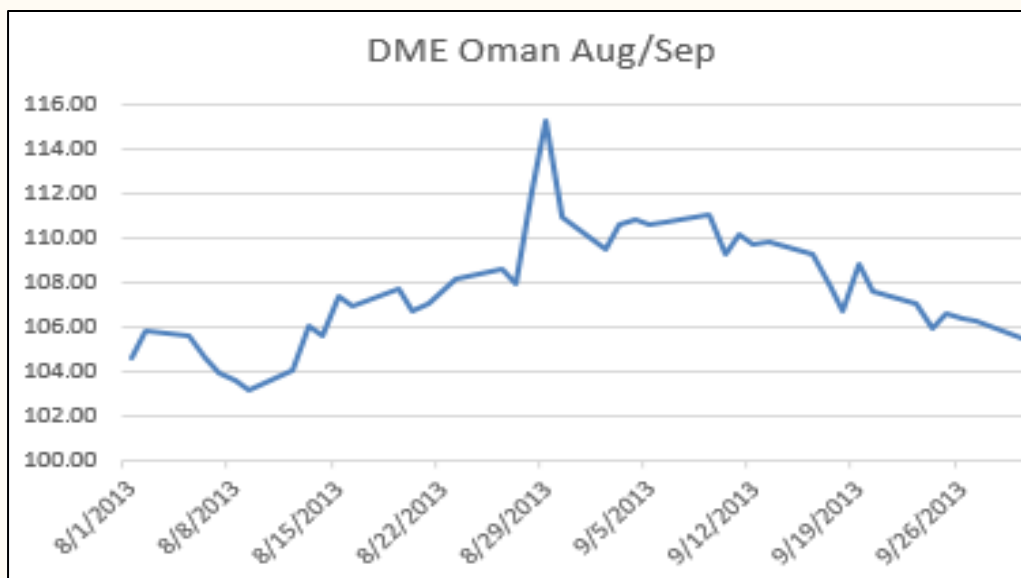
However the monthly average of the DME, which is used by Oman and Dubai to set their official selling price (OSP), was the highest level since March of this year at \$108.58.

Oman crude in the first half of September traded in a firm but narrow range of \$109-\$111/b, and most of the available November cargoes were sold during this

period, as Asian refiners in particular scrambled to cover requirements. However, as the Syrian and Iranian diplomacy came into focus prices gently eased during the second half of the month, before consolidating in the \$105/\$107 range in the last few trading days of September.

In addition to diplomatic efforts regarding Syria and Iran, traders cited the return of Libyan exports plus the anticipated increase in fourth-quarter Iraqi production for oil prices retreating from the late-August highs - while reassurances from Saudi Arabia that it would help keep the market well supplied also removed any lingering supply fears.

The US Federal Reserve's decision to maintain the monthly \$85 billion stimulus was generally seen as positive for headline oil prices, although the accompanying dollar weakness to



maintain quantitative easing at the same rate impacts on revenues for producers.

Moving into October, poor refining margins in both Asia and Europe could curb demand although with both regions moving into the peak-demand winter season, the market should continue to find support around the \$100/b level.

About DME

DME is the premier international energy futures and commodities exchange in the Middle East. It aims to provide oil producers, traders and consumers engaged in the East of Suez markets with transparent pricing of crude oil.

Launched in 2007, DME has rapidly grown into a globally relevant exchange. Its flagship Oman Crude Oil Futures Contract (DME Oman) contract is now firmly established as the most credible crude oil benchmark relevant to the rapidly growing East of Suez market. Reflecting the economics of the Asian region like no other contract, and the largest physically delivered crude oil futures contract in the world, DME Oman is the world's third crude oil benchmark and the sole benchmark for Oman and Dubai exported crude oil.

Manaar appreciates the assistance of the Dubai Mercantile Exchange in providing this market commentary

Outside US, many countries are blowing their shots at shale gas

By Robin Mills

Around 2002, a senior executive told me that the big oil company where he worked was not interested in Texas's Barnett Shale. The wells did not produce enough to be commercial, in his view. By 2008, US shale production was booming and the major oil companies were paying billions to get back into the game.

Now US gas prices have collapsed because of oversupply, the country approved its fourth liquefied natural gas export project last week, and its oil production has rebounded to levels last reached in 1989. Although there are both optimists and pessimists on the outlook for US shale, the weight of opinion is firmly on the side of continued rapid growth.

But when it comes to shale outside North America, virtually every analysis breathes conservatism, a warning that the US miracle will not be repeated. The UK's BG Group said that widespread shale gas production outside the US could be a decade off. Asiya Investments, from Kuwait, cautioned that: "On the global scene we see no major changes in the dynamics of Gulf oil in the next two decades".

Part of this is understandable prudence, a desire not to be carried away by hype. Progress on shale in China, the UK and Poland, where hopes had been high, has been slow.

The usual obstacles pointed out are that in most countries, the state, not the landowner, owns the mineral rights, so that local communities experience only disruption from drilling, not royalty cheques as in North America. China and Western Europe are densely populated and land is scarce. In China and South Africa, water for hydraulic fracturing may be in short supply. Other countries don't have the US's large and diverse drilling and services industry. And in Europe, environmentalist opposition has brought a moratorium in France and slowed drilling of a well in Sussex in south-east England – although it was not even targeting shale.

This leads to the conclusion that shale production outside the US will grow slowly, and will not bring down gas prices. As compared to US prices currently around \$3.60 per million British thermal units, European prices hover around \$10 to \$11 and import-dependent East Asia pays \$15 or more.

But this pessimism overlooks countervailing factors. Shale gas pioneers such as George Mitchell in the Barnett Shale did not know which techniques would work – they did not even know if shale gas could be produced commercially at all. They had to invent everything as they went. No wonder that it took two decades from the early experiments to the first profitable wells.

Now the industry knows that shale oil and gas works – and has wide experience

from thousands of wells across more than 10 very different major shales in the United States alone. Some are in flat, hardly populated, open country in south Texas or North Dakota. But the Barnett lies partly under the city of Fort Worth, and there are even producing wells at the airport. Other shales are drilled in the foothills of the Rocky and Appalachian mountains.

Technology has advanced enormously: many wells can be drilled from a single site; water can be re-used or replaced by other substances; and environmental impact can be reduced to minor levels.

The world's major oil and gas producers – OPEC and Russia – are lucky that other countries are blundering so badly in shale policy. But perhaps next to crack the code will be Australia, Colombia or the UK – or even a gas-short country in the Gulf, such as Saudi Arabia. Instead of a mantra of “shale won't work here”, and gloomy European declinism, the challenge for politicians and businesspeople should be: how do we make shale work in our country?

A version of this article appeared in The National newspaper on September 15th, 2013

Technology is not destiny as transport technologies evolve

By Robin Mills

The American inventor and entrepreneur Elon Musk is known for

his grandiose transport projects - Tesla's luxury electric cars, and SpaceX's rockets. His latest concept, the HyperLoop, would whisk passengers from Los Angeles to San Francisco at almost 1,000 kilometres per hour.

It is only a speculative concept at the moment and faces major technical and commercial challenges. But the HyperLoop is a valuable reminder that future transport - and its energy use - may be very different from today's.

Transport, like all technologies, builds on what came before. The width of a standard railway track is the same as an 18th-century coal wagon, which itself ultimately derives from the width of a Roman cart-horse's backside. Though today's cars are faster, more reliable and more comfortable, they are not very different in essentials from Henry Ford's Model T of 1908.

One radical innovation, though - self-driving cars - is a very realistic prospect over the next decade or two. Google's tests have now notched up more than 800 000 km. Self-driving vehicles will probably emerge gradually - satellite navigation, cruise control, radar warnings during lane changes and self-parking are already becoming standard features.

Seventy per cent of all the oil consumed in the United States is used for transport, and the cost of congestion is clear to anyone who crosses Bangalore, Cairo or Tehran at rush hour.

Environmentalists hope that self-driving cars will drastically reduce fuel consumption.

They could travel faster and closer to other vehicles without risking accidents, cutting air drag and congestion.

Autonomous vehicles would drive themselves more steadily and efficiently; electric cars would recharge themselves.

It might not be necessary for every family to own one or two cars - a vehicle could simply deliver itself when ordered.

That would mean fewer vehicles in total, fewer two-tonne tanks carrying a single passenger - and reduced demand for steel, aluminium, plastics and rubber.

Clean, silent electric vehicles that don't need parking space near homes and offices and pack themselves into smooth-flowing traffic would make it more attractive to live in the centre of cities. Non-motorists would be safer and healthier walking or cycling. This would reduce the total miles driven, and cut down on suburban sprawl.

But this vision might not come to pass. A general lesson of human history is that making something quicker, cheaper, safer and more convenient increases demand for it - indeed, we discover new needs that we would never have imagined before.

If we could travel in autonomous hyper-cars at 200 kph, while watching television, eating breakfast, reading or

sleeping, the hours of commuting from Sharjah to Dubai or Dubai to Abu Dhabi would seem a time for pleasant relaxation rather than torture.

Cars would probably become bigger and be outfitted with luxuries and accessories. Rather than stopping urban sprawl, living in a remote countryside mansion might become easier.

People currently unable to drive - such as children or the elderly - would be able to travel. That could reverse the narrative that ageing western populations will drive less.

So the driverless car might lead to a big reduction in the oil, gas and electricity

required for transport. It might also reshape cities and unlock mobility on a scale not seen since the British railway boom of the 1830s or the US freeways in the 1950s.

Radical transport innovations are not just a technology - they are a social phenomenon. Whether they are good or bad for people and our environment is not destiny - it is a choice about how we use them.

A version of this article appeared in The National newspaper on August 26th, 2013

Key MENA Energy Issues Scorecard

MENA energy price reform	●	↔	Major protests in Sudan over fuel price rises
MENA unconventional oil & gas	●	↑	Jordan signs MoU with Chinese company for oil shale power plant; Kuwait heavy oil targets reduced
MENA renewable energy	●	↔	Kuwait signs consultancy deal for 280 MW solar thermal power plant; Qatar solar plans scaled back to 1000 MW from 1800 MW
MENA nuclear power	●	↔	Masdar proposes small modular reactor for power & desalination; Saudi Arabia signs MoUs with nuclear firms
Energy infrastructure security	●	↑	Bombing in Erbil; Libya production back to 700 kbpd on western restart but eastern terminals still shut; further bombing on Iraq's northern pipeline on 16 th September; Yemen's Marib export pipeline restarts in late September; South Sudan begins restoring production after pipeline deal with Sudan
OPEC production	●	↓	OPEC production in August lowest since June 2011 on Libya disruptions, at 30.17 Mbpd, down 0.165 Mbpd; exports expected to rise in early October as Saudi exports increase
East Mediterranean gas commercialisation	●	↔	Possible test of oil offshore Israel; Israeli envoy supports LNG plant in Cyprus; Lebanon Cabinet still unable to define blocks; test of Cyprus Aphrodite appraisal well due in October
Kuwait energy projects progress	●	↓	Likely that 4 Mbpd 2020 production target will be delayed; heavy oil targets reduced; development of Dorra gas field shelved; Al Zour IPP said to be completed in 2015
Abu Dhabi concessions renewal	●	↔	Director-General of ADNOC says ADCO fields to operate normally after concession expiry
Baghdad-Erbil oil agreement	●	↓	KRG pipeline to tie in to new measuring station downstream from Baghdad-controlled station; Summail gas field to be developed for local power; KRG sent two proposals to the Kurdistan parliament, one for creation of Kurdistan National Oil Company (KNOC) and the other for creation of a monetary fund
Iraq oil production build-up	●	↔	Exports to fall further in September due to SPM work; 3 new fields to start late 2013, including Majnoon and Gharraf; leak in Rumaila pipeline was fixed and production recommenced
Egypt subsidy reform	●	↔	Gulf aid eases short-term fiscal pressure on government; plans (difficult to realise) to pay off debts to oil companies
Iran oil sanctions	●	↑	Thawing in US-Iran relations; exports up 100 kbpd to 985 kbpd and production up 30 kbpd to 2.68 Mbpd

Source: Manaar research

●	Very positive	↑	Improvement in last month
●	Positive	↔	No change
●	Negative	↓	Deterioration in last month
●	Very negative		

Energy Prices and Generation Costs in the Middle East

The following table represents September 2013 gasoline, diesel and electricity prices (top rate for residential consumers) in selected MENA countries, with the US for comparison, and the direction of change since last month.

		Gasoline (\$/Litre)	Diesel (\$/Litre)	Electricity (\$¢/kWh)
Saudi		0.21	0.09	6.9
Qatar		0.25	0.25	2.7
Bahrain		0.27	0.17	4.2
Kuwait		0.32	0.27	0.7
Iraq		0.34	0.72	6.7
Yemen		0.35	0.47	7.9
Oman		0.40	0.48	7.8
UAE	Dubai	0.48	1.01 ↑	10.35
	Abu Dhabi	0.48	0.88 ↑	4.0
	Sharjah	0.48	0.90 ↑	8.0

	Gasoline (\$/Litre)	Diesel (\$/Litre)	Electricity (\$¢/kWh)
Egypt	0.59	0.46	6.8
Iran*	0.69**	0.35**	1.65**
US	0.92↓	1.04 ↑	12.61↑
Lebanon	1.17	0.88	13.3
Jordan	1.29	1.14	33.2

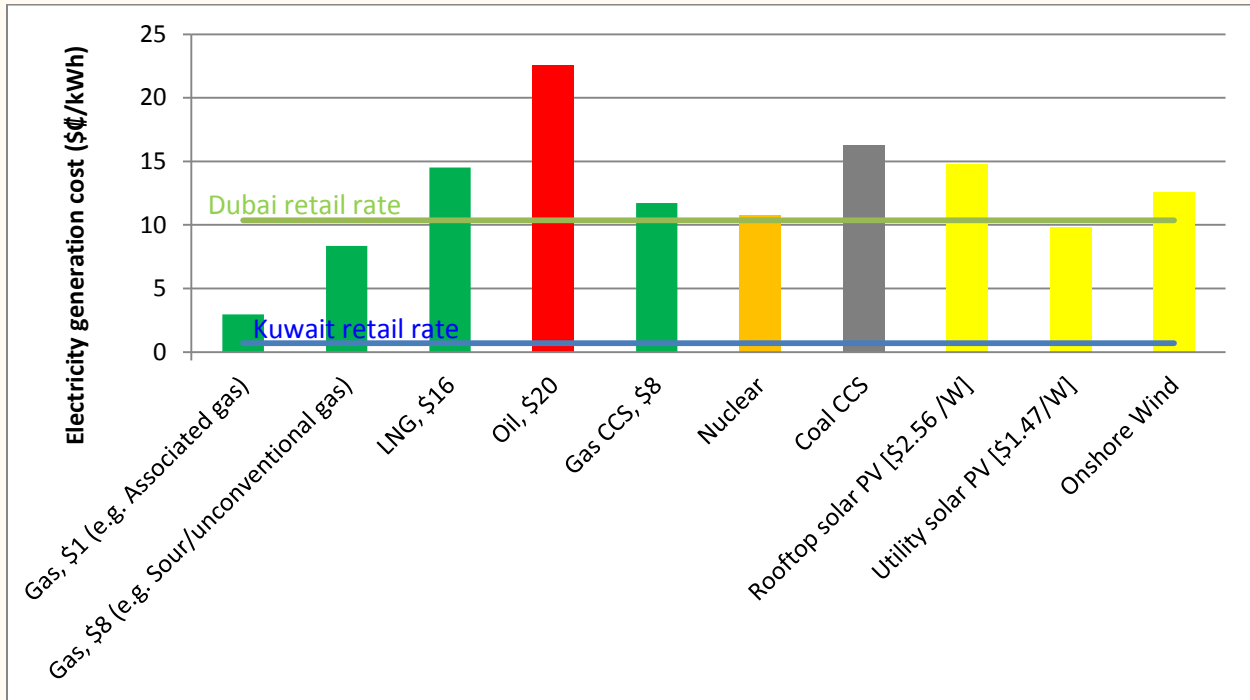
* Non-subsidized allocation, at current (volatile)

** Values changed mainly due to changes in the exchange rate

Open-market exchange rate (US\$1:IR 29000)

Source: Gulf Oil Review; Manaar research

Note: The figures of the gasoline and diesel in the table above represent the pump prices. Only the US, Lebanon and Jordan prices can be considered non-subsidised.

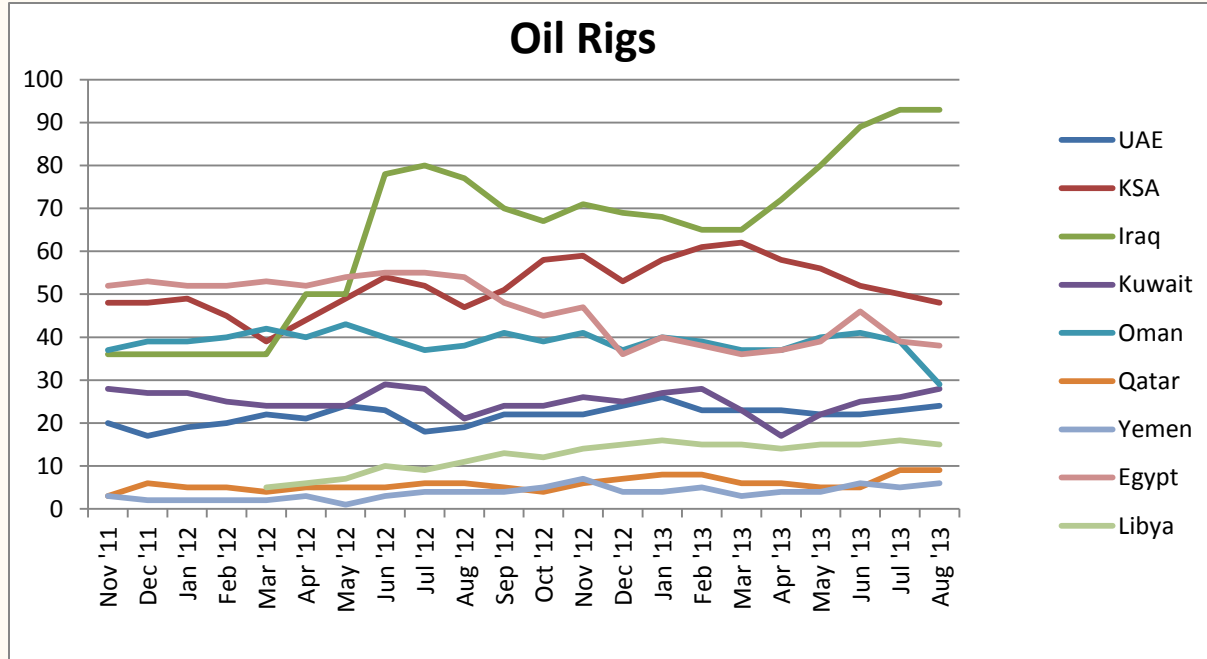


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Main changes: increased capital cost of nuclear in line with UAE programme; reduced uranium price; included nuclear decommissioning costs; included onshore wind in UAE conditions; differentiation of utility-scale and rooftop solar; inclusion of 1 c/kWh transmission & distribution credit for rooftop solar; slight increase to assumed LNG price; significant increase to capital & operating costs of coal CCS based on latest EIA assessment; minor changes to costs & heat rates for other plants based on latest EIA assessment.

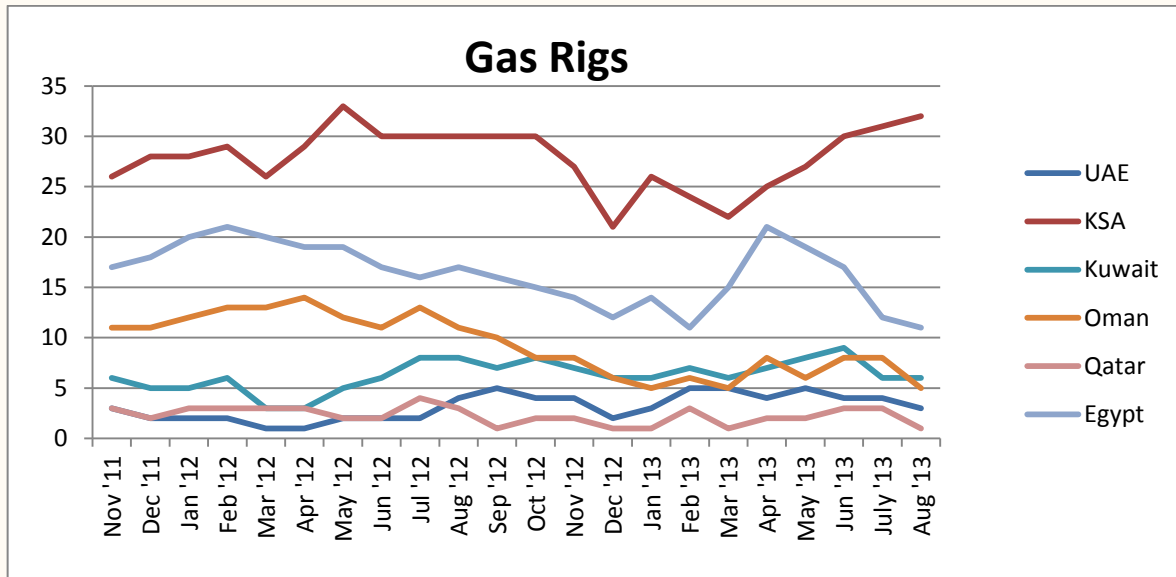
- Utility-scale solar PV is now clearly a more economic option than LNG- or oil-fired power generation, even allowing for the cost of back-up plants
- Gas CCS, though higher cost than solar and nuclear, could still be a viable low-carbon option, particularly if combined with use of CO₂ for enhanced oil recovery
- Coal CCS is much less attractive now, due to the significant increase in its capital and operating costs
- Unconventional gas remains economically attractive, still with a 15-25% cost advantage over nuclear and solar PV
- Onshore wind (based on UAE conditions), even with gas backup, appears competitive with LNG-fired power, but may be limited to suitable sites
- In the GCC, only Dubai has top-rate tariffs that are representative of the new era of generation costs

Regional Energy Statistics



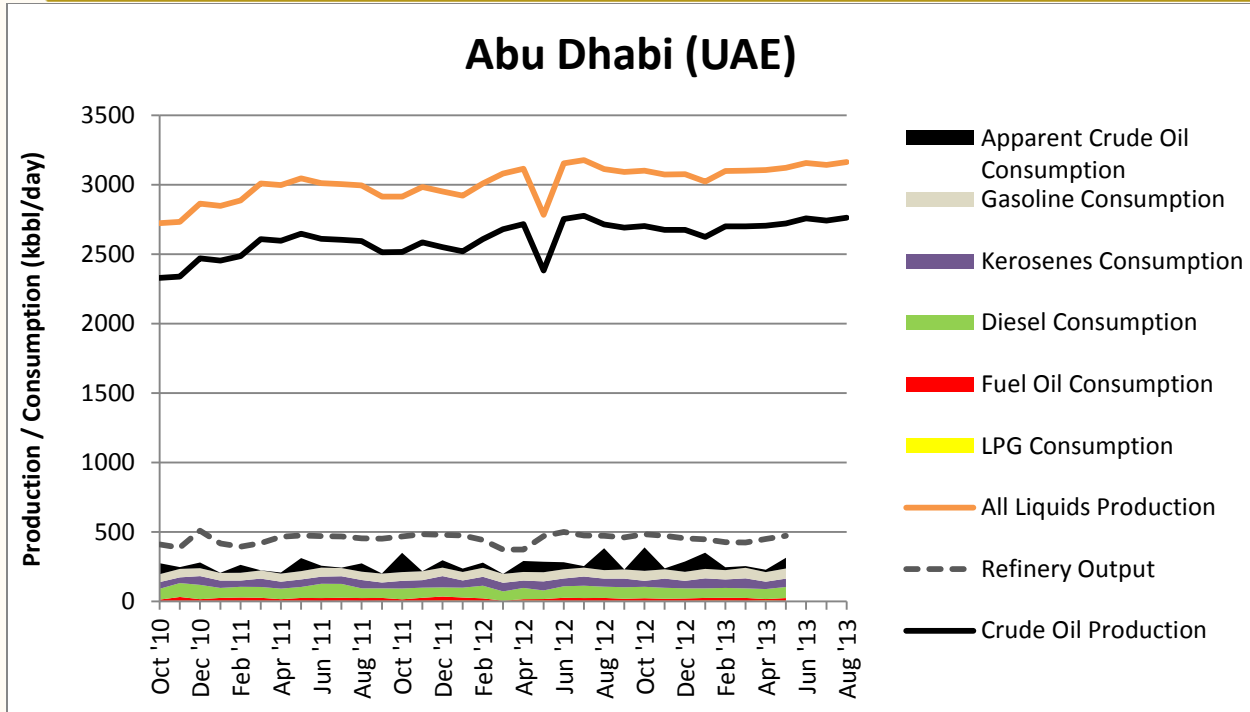
Source: Baker Hughes, Iraq; Baker Hughes and OPEC Monthly Oil Market Report

- Saudi Arabia drilling continues to decrease for the fifth consecutive month; however, the Kingdom is expected to increase to a record 170 rigs (oil + gas) by the end of 2014 due to Khurais and Shaybah expansions
- Iraq rig count remained constant over the month of August, after 5 months of continuous growth
- Oman rig count reached a 22-month low of 29 rigs in August
- All other countries' rig counts remained quite stable over the month

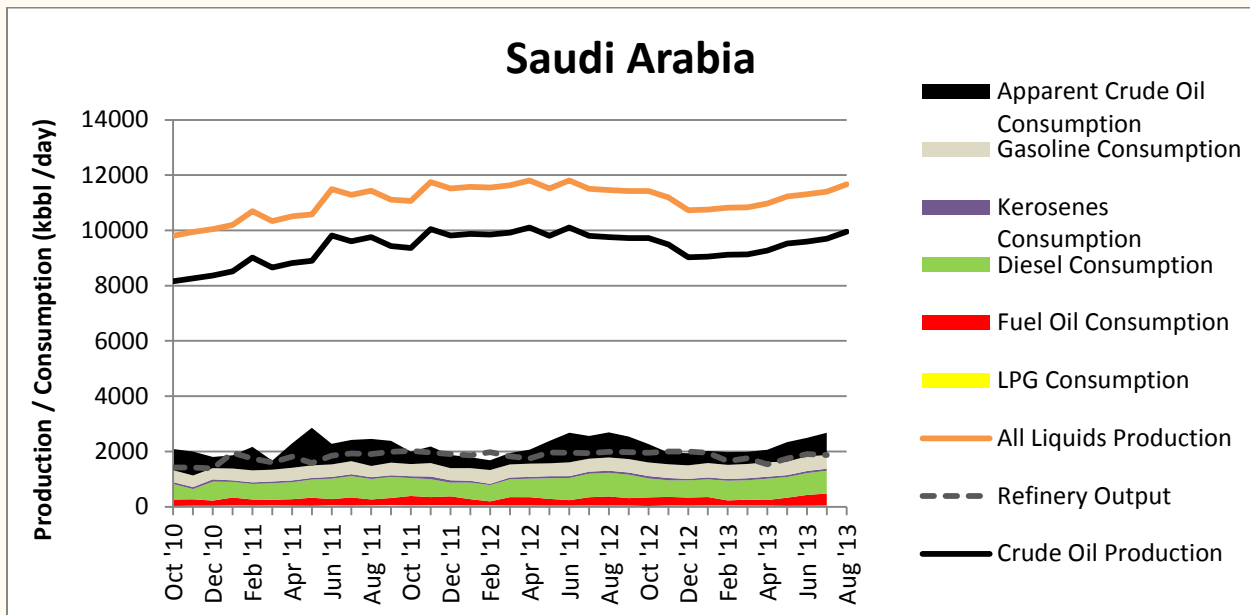


Source: Baker Hughes

- Saudi Arabia's gas drilling continued to increase in August to come close to the record high level of May 2012
- Egypt's rig count continued to fall for the fourth consecutive month after reviving in April
- All UAE gas rigs are located in Abu Dhabi; there are no current gas projects in Dubai
- Oman's rigs faced a decline in August after stabilizing in July
- Qatar rig count dropped in August to reach only 1 rig with the completion of drilling on the Barzan gas project (which had been using 3 jack-ups)



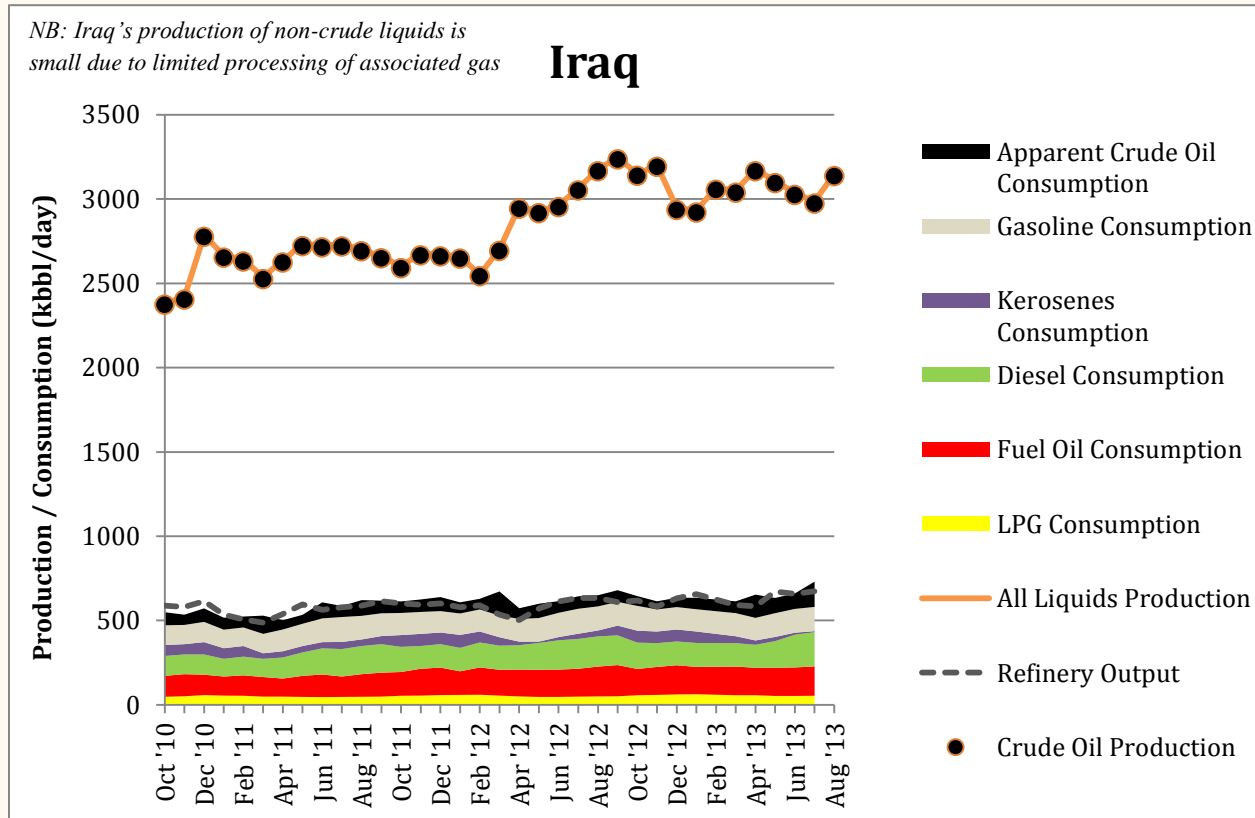
- The country's production remained stable throughout August
- Abu Dhabi has not updated its consumption figures for the past two months

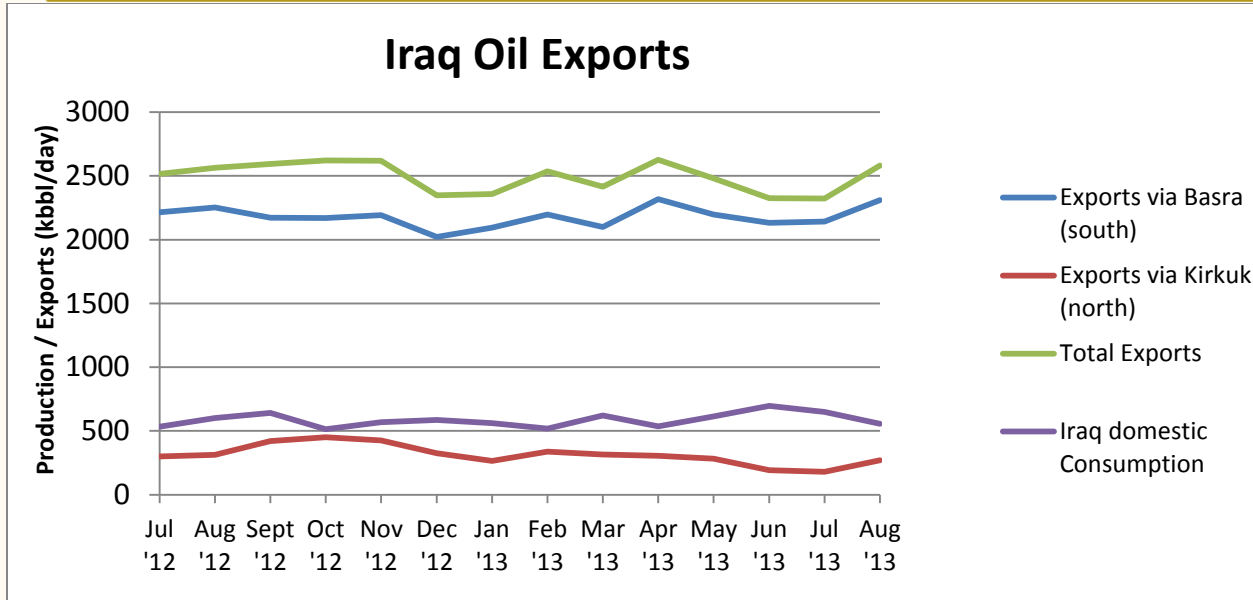


- Saudi crude oil production increased by 36 kbpd in August to 9.96 Mbpd, to help cover losses from Libya and Iraq as well as meeting increased domestic demand in summer

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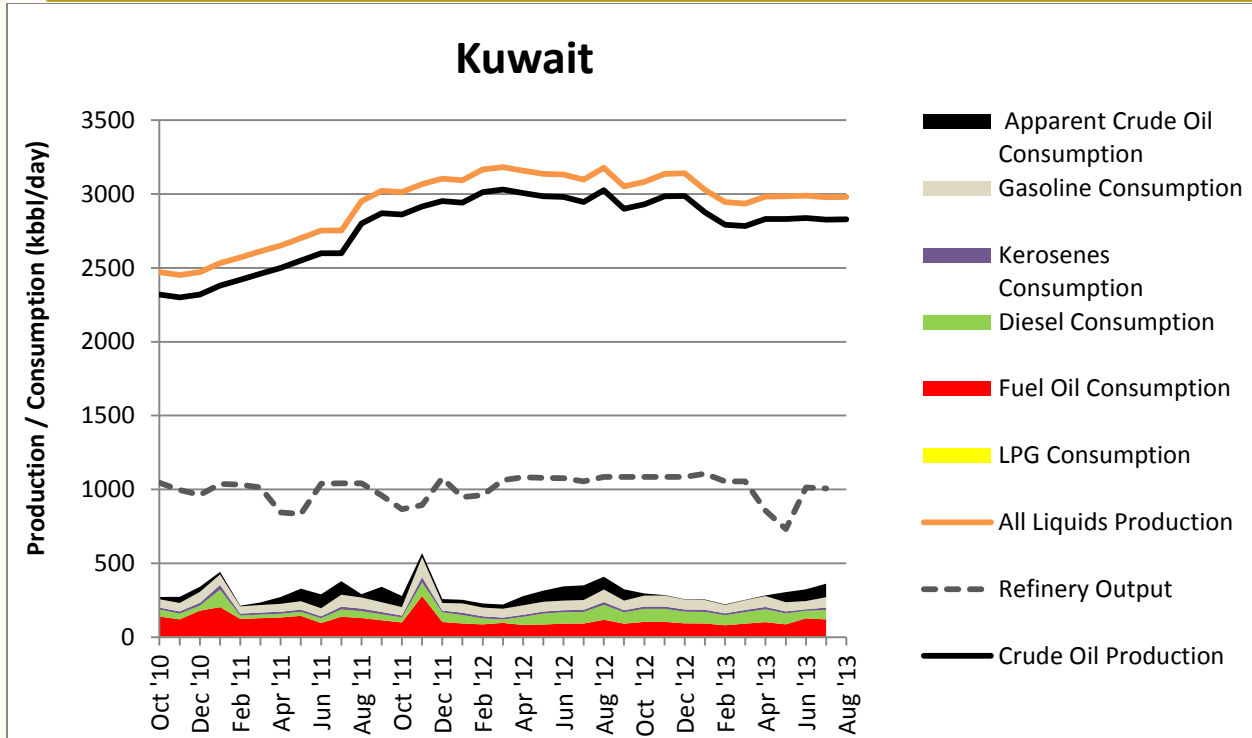
- Saudi oil production reached 10 Mbd in September, achieving the fastest production rate in 24 years.
- Domestic consumption continued to increase, with fuel oil and direct crude oil consumption expanding as the summer heat rises. However direct crude burning is lower this year than 2011 or 2012 due to more use of fuel oil and gas



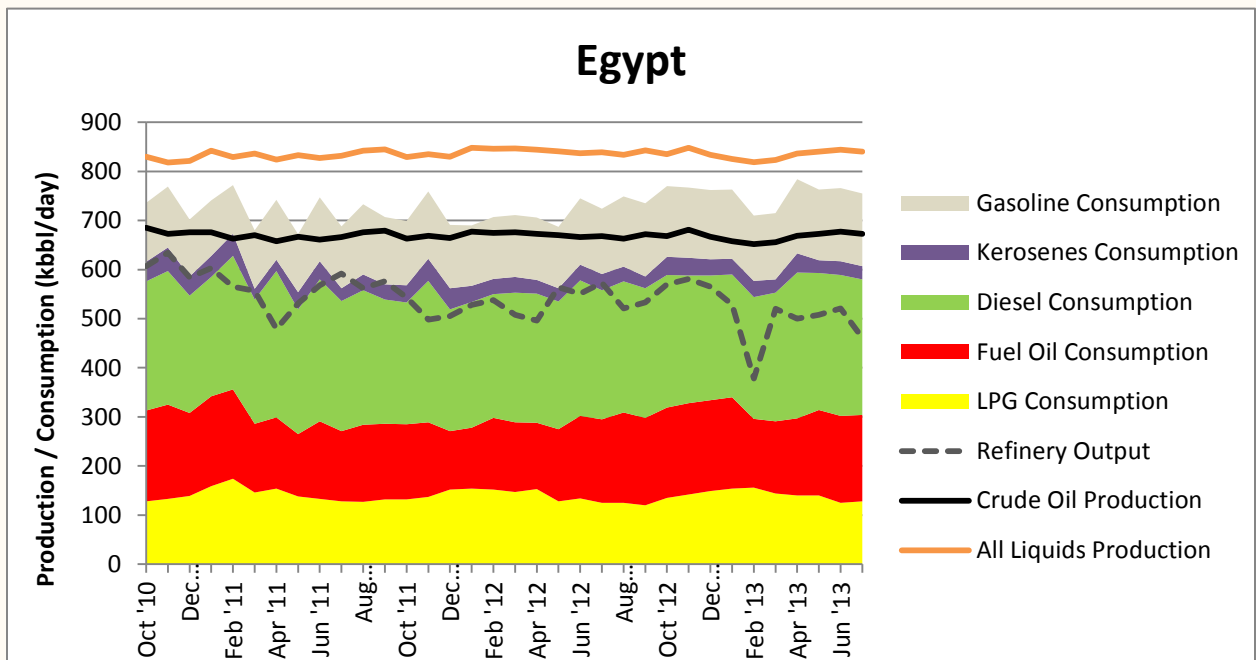


Source: Iraq Oil Ministry

- Iraq's crude oil production bounced back in August after a three month fall to reach 3.1 Mbpd
- Iraq's crude oil production witnessed the biggest drop among other OPEC countries in September to reach 2.7 Mbpd, this is mainly due to the partial shutdown of Basra oil terminal during the month.
- Iraq's crude oil exports increased notably to 2.309 Mbpd in August after falling for four consecutive months. However exports dropped significantly in September to reach 1.821 Mbpd due to the planned major upgrade of the southern terminal.
- Iraq's output is expected to increase by 400 kbpd by the end of this year as Shell starts production at Majnoon in October (175 kbpd), plus the start-up of Gharraf (Petronas/Japex) in August, at an initial 35 kbpd



- Kuwait oil production was steady in August
- Crude and fuel oil consumption continued to increase due to the high temperatures in the summer



- The refinery output dropped by 60 kbpd in August to reach a total of 461 kbpd

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- Fuel oil and diesel consumption increased due to the increasing temperature and upcoming harvest
- Saudi Arabia, Kuwait and the UAE have provided fuel shipments to Egypt to support the new government

Source: JODI, OPEC, Middle East Economic Survey & EIA

NOTE: All crude oil consumption values are apparent due to unreported / misreported stock change values and refining gains/losses.

Recent & Forthcoming MENA Licensing Rounds

Country	Round	Launch Date	Blocks on Offer	km ² offered	Blocks Awarded	Closing Date
Egypt	EGAS	Jun - 12	15	57,300	8	Feb - 13
Egypt	Ganope	Dec - 12	20	125,577	-	May - 13
Iraq	Nassiriyah refinery / field development	Dec - 13	1			
Iraq	5 th Licensing Round	NA	10	NA	-	NA
Lebanon	1 st Licensing Round	May - 13*	10	17,901	-	Nov - 13
Oman	MOG	Jan - 12	4	26,837	2	Aug - 12
Oman	MOG	Nov - 12	7	103,422	-	Jan - 13
Yemen	6 th Licensing Round	Sep - 12	5	20,132	-	NA
Yemen	March 2013 Licensing Round	March - 13	20	222,812	-	May - 13

Updates since last issue in red

Source: Deloitte; Manaar Research

* The Lebanese bid round has been delayed from the planned deadline of 2nd September due to political disputes over the caretaker Cabinet

Current studies

Hydraulic fracturing

Manaar has recently completed a study of the market for hydraulic fracturing in the MENA region, with PacWest Consulting. The report is available in MENA-only (29 pages) and worldwide versions (45 pages including the MENA section). The report addresses historical and forecasted frac demand, supply, utilization, constraints and trends. Market coverage also includes current hydraulic fracturing projects, unconventional potential assessments and detailed basin and play maps. The majority of the information gathered in the reports relies on primary intelligence: in-depth surveys and conversations with industry leading experts and technical specialists.








Dimension	Score	Description
Geology		▪ Excellent geology that underlies the most prolific petroleum system in the world; Rub' Al Khali results disappointing thus far
Pricing regime		▪ State-set at very low \$0.70 per mcf; unlikely to change soon; very problematic for foreign operators seeking JVs; less of an issue for Aramco, which wants to displace oil
E&P diversity		▪ Aramco dominates; JVs with three IOCs in the Rub' Al Khali have been disappointing; fiscal terms are difficult
OFS capacity		▪ SLB and HAL already serve the country, and BHI and others should enter the market in the next few years
Regulatory landscape		▪ Aramco is able to operate with little government interference, but challenges exist for foreign operators, if allowed to operate in unconventional development at all
Infrastructure		▪ Very well-developed infrastructure from existing petroleum output in Ghawar and northwest, but Rub' Al Khali is isolated
Development constraints		▪ Public very supportive of increased output
Weighted Score	2.6	

Figure 1. Country attractiveness matrix for Saudi Arabia

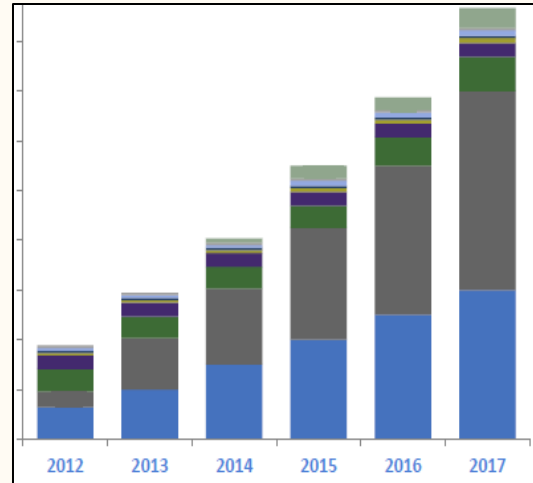


Figure 2. Forecast frac capacity, per MENA country

Please contact Roa Ibrahim
r.ibrahim@manaarco.com, +971 4-3266-300 for further information and purchases.

MENA petrochemicals

Manaar is preparing a potential study of MENA petrochemicals and gas feedstock. The study will focus on

- the current gas situation in MENA,
- implications for petrochemicals in the region
- the downstream / speciality petrochemical value chain
- competitiveness of MENA petrochemical companies versus the US, EU and Asia

This study will be of key interest to large Gulf-based and international petrochemical producers and gas suppliers.

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Manaar has prepared a study on the impact of global shale resources on MENA. The study will focus on:

- The strengths, weaknesses, threats and opportunities of unconventional gas in the MENA.
- Differences in the development of unconventional gas between North America and MENA.
- Identifying MENA's unconventional gas potential; understanding current and planned activity levels per country, company and basin.
- The impact of the shale boom on future demand for MENA oil & gas, oil and gas prices, possible new pricing hubs, and oil and gas exports.

Recent & Forthcoming Events

Robin Mills spoke on:

- UAE industry developments at MEED UAE Oil and Gas Greenfields Conference, in Sofitel Abu Dhabi, UAE on 10th September 2013;
- Middle East Shale gas at [the Association of Geoscientists and Engineers \(EAGE\)](#) at the Dead Sea, Jordan on 16th September 2013

- East Mediterranean gas and politics at the National Defense University (NDU) in Washington DC, USA on 18th September 2013
- Middle East and global gas issues at the Power and Water Middle East Leaders Forum at the Abu Dhabi National Exhibition Centre on 23rd September 2013
- Middle East solar power prospects at [the Arabian Power and Water Forum](#) in The Address hotel, Dubai Marina, UAE on 23rd September 2013

Please visit the links below to view some of the presentations by Manaar:

[Arabian Water & Power Forum Dubai – September 2013](#)

[Power & Water Middle East Leaders Forum Abu Dhabi – September 2013](#)

[EAGE Jordan Middle East shale gas – September 2013](#)

[INSS East Mediterranean gas – September 2013](#)

[MEED UAE Oil & Gas Projects Abu Dhabi – September 2013](#)

Key Manaar people



**Jaafar Altaie,
Managing Director**

Jaafar founded Manaar in 2009 in response to growing international interest in Iraq. With a background in economics and engineering, Jaafar has worked for BP, Nomura, Petrobras and the Iraq Ministry of Oil.



**Robin Mills,
Head of Consulting**

Robin is an expert on Middle East energy strategy and economics. He is the author of two books and a prolific writer on energy and environmental issues. He worked for 15 years in geology and economics for Shell and the Dubai government.



**Chad Al-Sherif Pasha
Advisor**

Chad is a geo-political advisor and senior project manager with a successful track record developing strategic initiatives with corporations and governments. He has particular expertise in Central Asia.



**Roa Ibrahim
Industry Analyst**

Roa Ibrahim received her Bachelor's degree in Finance from the American University in Dubai and her Master's degree in Applied Finance and Banking from the University of Wollongong in Dubai. Roa has produced expert analysis of petroleum fiscal systems, hydraulic fracturing and shale gas.

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