Photo courtesy of LNG World Shipping News: Egypt expected to spend $3 billion on LNG imports this year

GAS MARKET GETTING TO GRIP WITH LONG-TERM UNCERTAINTIES

Qamar Energy

OCTOBER 2016

Events	Response
Increasing amount of LNG from US, Australia and Russia leading to long-term uncertainty of Middle Eastern LNG exports	• Qatar **renegotiating contracts** at lower prices and signing new contracts: renegotiated India LNG contract to US$5 per MMBtu from $12 and signed new 15-year contract with Pakistan • Qatar **acquiring stakes internationally** in LNG regasification and liquefication facilities
Asian demand	• Understanding long-term **Asian gas demand uncertainties**: 1) economic growth 2) new infrastructure to supply gas to customers 3) development of gas for transport market 4) Competition with coal, depending on price & pollution controls • Developing new and niche markets (e.g. Pakistan, Bangladesh)
Government measures to expand gas infrastructure	**Advancing infrastructure:** Smart cities (Dubai), new pipelines (Iran-Oman, Iran-Iraq) and LNG import terminals (Sharjah, Bahrain), expanding gas (Egypt, India) and power grids (Jordan)
Higher population, higher power demand, higher demand for clean energy	Some MENA countries are facing challenges meeting domestic demand for gas, thus creating **new regional domestic consumers/importers**: Abu Dhabi's ADNOC FSRU unit, Aramco considering gas imports, Kuwait and Bahrain planning new/expanded LNG import terminals
Natural gas prices unsustainably low	**Market rebalancing will take longer for gas than for oil** - LNG prices likely to stay low into 2020s - Qamar forecast for LNG price in 2020: $7 (low)-$12.20 / MMBtu (high); MENA region plans to increase annual LNG import capacity by 58.2 BCM in 2021 from current 39.1 BCM (Arab Petroleum Investment Corp)
Customers looking to reduce oil indexation & seek shorter and more flexible terms	Indexing on oil (Brent, JCC) will remain the most common choice in MENA/Asia but **Henry Hub index is gaining popularity**; also Singapore hub & other candidates

Gas industry has a great story to tell – but doesn't

By Robin Mills

A *version of this article appeared in The National newspaper on October 9, 2016*

Fracking for natural gas does not enjoy good press: 53 per cent of Americans oppose it, only slightly better than the 57 per cent who are against despised coal mining. The United Kingdom's opposition Labour Party has pledged to ban fracking in the (unlikely) event it wins power. The industry is delivering more gas at lower prices than ever before, but it is losing the battle for public opinion. And it does not seem to care.

In newspaper articles and at industry conferences, gas companies make their case in fact-heavy, logical presentations. On television, in pursuit of media "balance", an impassioned environmentalist or concerned local resident is interviewed alongside a grey-suited, earnest corporate executive.

The gas industry has a great story to tell. Largely because of the hydraulic fracturing of shale rocks, North American production has boomed and consumers have enjoyed a windfall from sustained low prices. US exports of liquefied natural gas are now turning up around the world, including in Dubai, Kuwait, Jordan and Egypt.

As the UK's own gas production runs down, it has stepped up imports. Last month, the chemicals firm Ineos received a shipment of US ethane – probably mostly derived from shale gas – at its Grangemouth industrial centre in Scotland. According to Ineos, Grangemouth generates 3 per cent of Scotland's GDP and employs 1,300 people. Last week, the UK firm Cuadrilla was given permission to hydraulically fracture four wells in Lancashire in the north of England.

Gas, clean and highly efficient, is far better for the environment than coal, its main competitor. It does not displace renewable energy sources, such as wind and solar, but works alongside them. Local environmental impacts of shale gas extraction can be managed with careful regulation and responsible operatorship.

These facts, enshrined in dozens of peer-reviewed scientific papers and independent reports, have failed – and will continue to fail – to convince shale gas opponents. Hard line environmentalists and climate change deniers shout at each other over the heads of the moderate majority, vulnerable to emotive fear mongering.

The US gas companies have not helped themselves. They have failed to call out a few cowboy operators who tarnished the shale business in its early days. Reflexively fighting any regulation, even reasonable ones, they create the impression of having something to hide.

The gas companies and their home states, such as Texas and Oklahoma, are strong backers of Donald Trump. But his energy "policy" – inasmuch as any coherent programme emerges from a mishmash of campaign asides – would promote coal, in practice at the expense of gas. This stance will not win much sympathy from a likely president Hillary Clinton.

Instead, gas companies could rebuild a coalition with moderate environmental groups, as between 2007 and 2010 when Chesapeake Energy, one of the largest shale drillers, donated to the Sierra Club. But this would have to avoid

"greenwashing" and undue corporate influence.

Demonstrating carbon capture on gas-fired power would undercut the argument that shale gas is incompatible with long-term action on climate change.

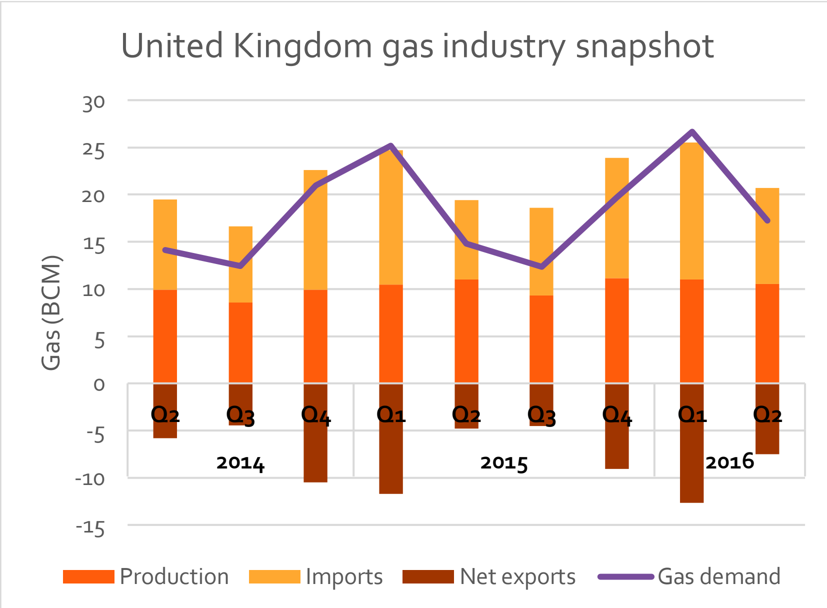
Russia has sought to protect its own gas exports by backing eastern European anti-shale groups, and has sought a rapprochement with the US Green Party presidential candidate Jill Stein.

National security hawks appreciate that lower European dependence on Russian gas is a good thing.

Local communities should benefit from economic development and jobs, as Ineos has stressed for Grangemouth. As shale gas operations proceed, tax revenue and employment arrive, and negative impacts are seen to be minor, future projects may go ahead more smoothly.

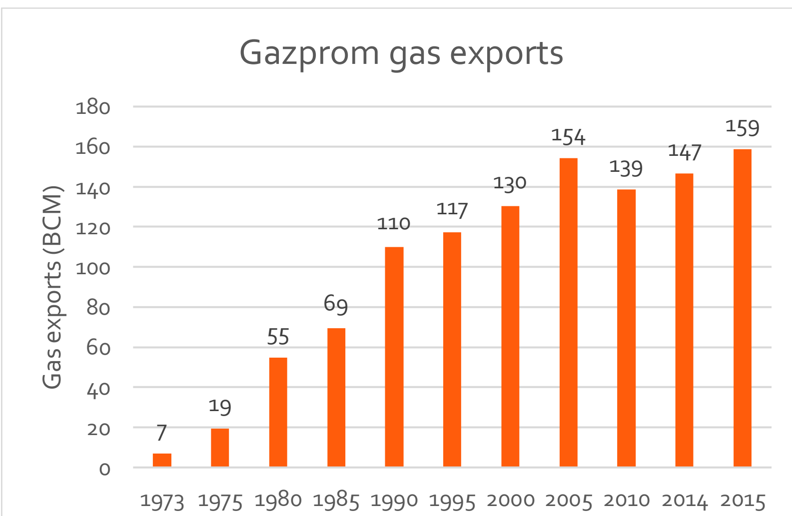
The GMB Union, the third-largest donor to the UK Labour Party, praised the government's decision on Cuadrilla as "pragmatic" and said Labour's proposed ban was "madness" and "nonsense".

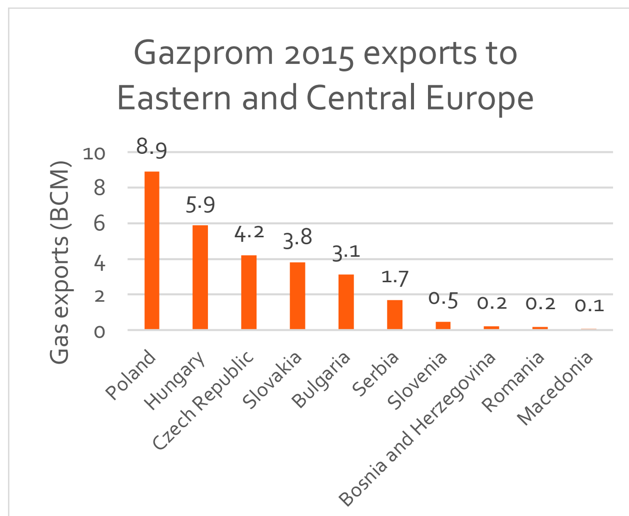
Madness and nonsense it may be, but the gas industry is winning the argument too slowly to be a commercial and environmental success. It needs a radical change in its media, public and political outreach to make its case on both sides of the Atlantic.

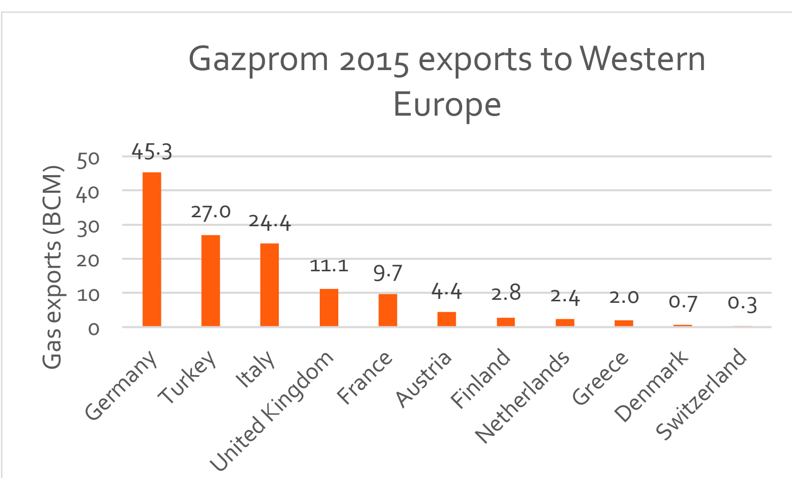


Source: Gov.UK; Qamar Research

- UK's own gas production is running down and imports going up, as discussed above
- In Q2 2016, gross production of natural gas was 4% down on Q2 2015
- Imports up in comparison to Q2 2015, by 20%, driven by a 34% increase in imports from Norway
- Exports down by 27%, driven by a decrease in exports to Belgium and Ireland (in part due to the production of Corrib in late 2015)
- Overall gas demand in Q2 2016 increased by 16.4% compared to same quarter last year fueled by growth in demand for electricity generation (up by 47% from Q2 2015)
- The principal driver for this increase in power gas demand is the reduction in coal generation capacity
- The opposition Labour Party it would ban shale gas production in the UK for environmental reasons, if elected
- Qatar is the major LNG supplier to UK, but is diverting LNG from Britain to Asia due to high demand from KOGAS (long standing customer)
- Britain does not have long-term contracts with Qatar for LNG, so deliveries are not contractually guaranteed. Qatar can shift shipments to better priced-markets
- Will UK diversify imports to avoid reliance on Qatar (for example US?) or would there be an increase in long-term contracts with Qatar for consistent supplies?







Source: Gazprom; Qamar Research

- Qatar was the most diversified LNG supplier in 2015
- Russia's Gazprom sees record gas exports to Europe in 2016 and set daily record gas exports to Europe in October at 590 BCM
- LNG supplies from the United States may undercut Russia's dominant share of European gas markets currently at approx. 30%
- Gazprom Group established a new company to develop gas for transport business in Europe: Gazprom NGV Europe
- Gazprom competitors: Rosneft and Novatek

Deepwater Horizon film a grim lesson on safety for Middle East drillers

By Robin Mills

A *version of this article appeared in The National newspaper on October 18, 2016*

Imagine the Egyptian-American heart-throb Rami Malek playing the earnest engineer on a doomed oil rig, as a sinister Ghassan Massoud, the company man, tells him to ignore safety concerns. Deepwater Horizon, Hollywood's take on BP's 2010 Macondo disaster in the Gulf of Mexico, is a gripping reminder of the industry's risks. As it shows in cinemas here, Middle East oil executives will want to avoid ending up on the big screen themselves.

The film itself stars Mark Wahlberg as the decent blue-collar technician Mike Williams, Kurt Russell as the respected veteran rig boss "Mr Jimmy" Harrell and John Malkovich as the snarling BP representative Don Vidrine.

We should not look to Hollywood for nuance or scrupulous adherence to facts, particularly when it comes to depicting big oil companies. Deepwater Horizon makes some necessary simplifications. It shows moments of heroism, some real, some invented – such as Mr Williams's rescue of the navigator Andrea Fleytas, as Ed Crooks's excellent review in the Financial Times notes.

Most gallingly for a BP audience, all the blame is pinned on them, with Malkovich the ideal actor to menace the Transocean staff with the size of his company and the budget overruns their delays are causing. In reality, the official US government report found that Transocean and Halliburton were also partly responsible.

But Deepwater Horizon does a decent job of explaining the accident to a non-technical audience and conveying something of how the offshore drilling industry is organised, with an oil company such as BP hiring a rig from a drilling contractor, in this case Transocean.

It conveys the visceral power and terror of the explosion and fire. And – as the crew ignores anomalous pressure readings, turns off over-sensitive fire alarms and complains about but doesn't fix malfunctioning phones – it shows the truth behind almost every serious industry accident. Such disasters are almost never the fault of villains but arise from a long chain of minor errors.

Other than in the eastern Mediterranean, there is little deepwater drilling in the Middle East and a disaster like in the Macondo Prospect might seem unlikely. But the region's oil industry has suffered serious accidents in the past. In 1995, a well blew out spectacularly in Shell's El Isba field in Syria. Five men died in the battle to contain the fire, whose flames could be seen from aircraft more than 400 kilometres away.

A leaking pipeline led in 2002 to a massive conflagration that destroyed a gathering centre at Kuwait's Raudhatain oilfield, with four workers dead and 600,000 barrels of oil production knocked out. And in 2004, a massive explosion destroyed three of the six processing units at Algeria's Skikda liquefied natural gas plant and killed 29 people.

Most recently, Iran has suffered a worrying series of accidents to petrochemical plants and pipelines. While raising suspicions of cyberattacks, these incidents seem more likely to be because facilities were built and operated shoddily under the pressure of sanctions.

A blowout of high-pressure sour gas, containing deadly hydrogen sulphide, could cause mass casualties if it occurred near a populated area. The Arabian Gulf, a sixth the size of the Gulf of Mexico, has suffered numerous oil spills, mainly from tankers. A serious leak would devastate coral reefs and dugong breeding grounds and could threaten the intakes of vital water desalination plants.

Even taking the film's specifics with a pinch of popcorn, the Middle East's petroleum leaders can benefit from its overall message. Safety must come first: even minor breaches cannot be tolerated and those who raise concerns have to be listened to. The best tribute to the 11 men who died is to ensure nothing like Deepwater Horizon happens here.

Source: IMDb; Mark Walberg plays chief electronics technician Mike Williams

Oil industry must back workable climate policies

By Robin Mills

A ***version of this article appeared in The National newspaper on October 23, 2016***

If the oil industry does not support sensible climate policies, it will suffer from stupid ones. Rex Tillerson, the chief executive of ExxonMobil, last week complained about a "hodgepodge" of climate policies. But large oil companies have only themselves to blame for failing to seize the initiative on climate.

American ones in particular have instead lobbied against climate action in general, tried to cloud the science and continue to back Donald Trump's energy illiteracy. But the voice of Middle Eastern oil firms, with the most to lose in the long term, is not being heard either.

The resulting mishmash often does little good for the climate, is expensive for consumers and businesses, and obscures the true cost.

These include unnecessary subsidies to mature forms of renewable energy, preference for costly technologies over straightforward changes in behaviour or energy efficiency, and biofuel mandates that have led to deforestation and rising food prices.

Meanwhile, promising low-carbon technologies outside the renewable energy and electric-vehicle lobby fail to secure support.

As renewable energy industries grow in size, they will exert increasing political power, particularly in North America and Europe, where they already benefit from strong public and environmentalist support. That is their right, as for any other business, but it raises the danger of counter-productive policies designed to favour certain companies, or protect profits more than the environment and consumers.

The cleanest approach would be an across-the-board tax on carbon dioxide emissions globally or, more realistically at first, regionally, with revenues used to reduce other taxes. Such a levy is moving up the agenda in North America. Washington state votes next month on imposing a charge at US$25 a tonne on carbon dioxide. The Canadian prime minister Justin Trudeau announced last month a federal tax, starting at $10 a tonne and reaching $50 by 2023.

The European Union and now China are using schemes with tradable permits, similar but more complicated.

For comparison, a $25 per tonne tax would, in my calculations, add about 3 fils per kilowatt-hour to the cost of electricity from gas, about 22 fils per litre to petrol prices, and about Dh80 to a Dubai to London return flight ticket.

Mr Tillerson said that a cost on carbon was the best way to reduce greenhouse gas emissions. Shell and BP have long backed such a tax, with BP last year saying a charge of $40 a tonne would make gas more affordable than dirty coal.

But John Watson, the chief executive of Chevron, the second-largest US oil company, last year opposed carbon taxation. Emails leaked from Hillary Clinton's campaign record an internal campaign debate on whether to support a carbon tax, eventually rejected because of unfavourable polling.

A carbon tax would hit gas's main competitor – coal – hardest. At a time of depressed US gas prices, it is surprising that, by opposing carbon charges, gas companies are so charitable towards a rival industry.

The Middle East can benefit from, or at least adapt to, the use of carbon pricing worldwide. Canadian willingness to tax its oil sands' higher-carbon oil production favours the Middle East. An increased cost of carbon in Europe and Asia would reduce the attractiveness of coal, favouring liquefied natural gas exporters such as Qatar. And a long-term sustainable role for the region's vast hydrocarbon endowment, including carbon capture and storage, will come about only with supportive policies.

Ten oil and gas companies issued a statement last October backing effective action on climate. This included four state petroleum firms, but only one from the Middle East – Saudi Aramco. The region's national oil companies have traditionally been reticent to engage in public debates. But as they become more international, and like Aramco seek to sell shares, they need to back workable climate measures more vocally, at home and abroad.

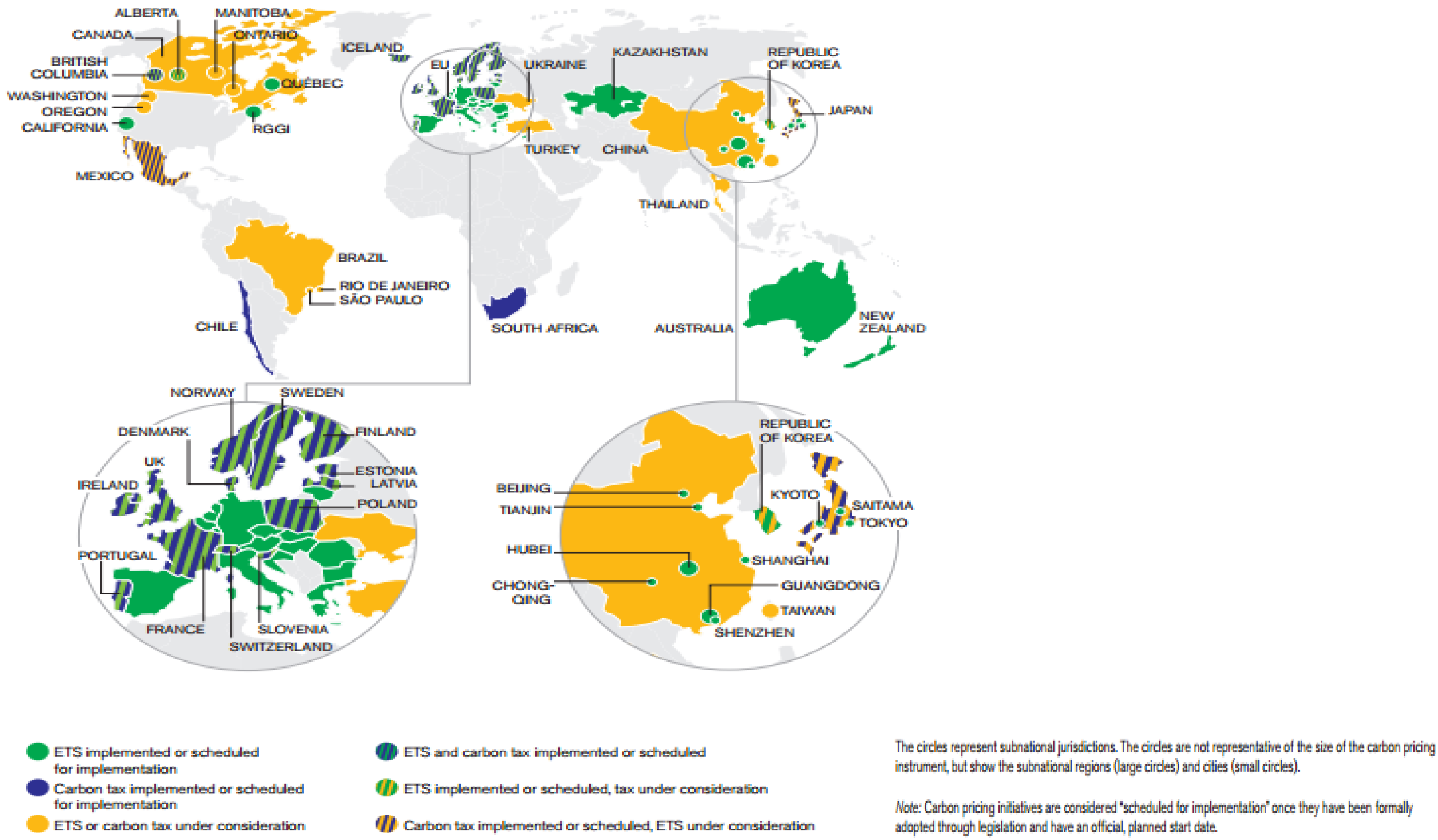
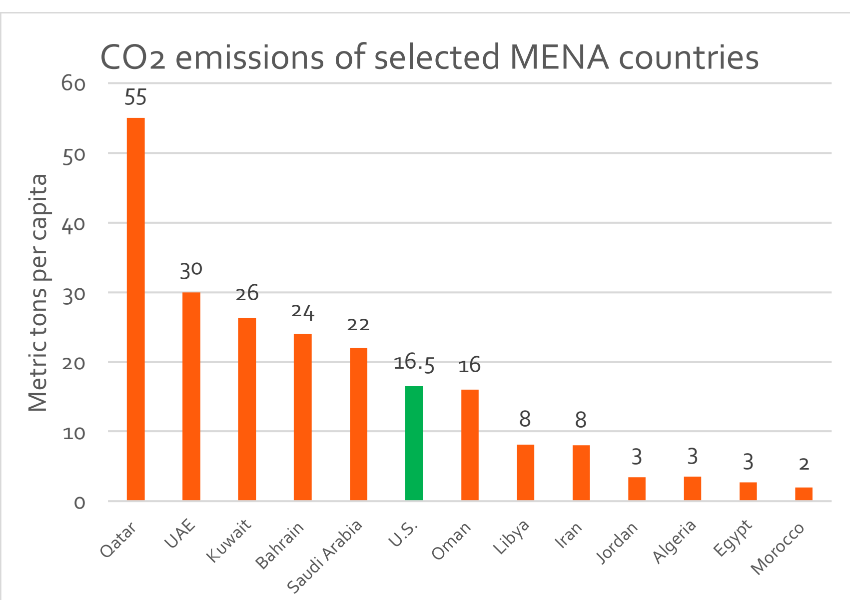
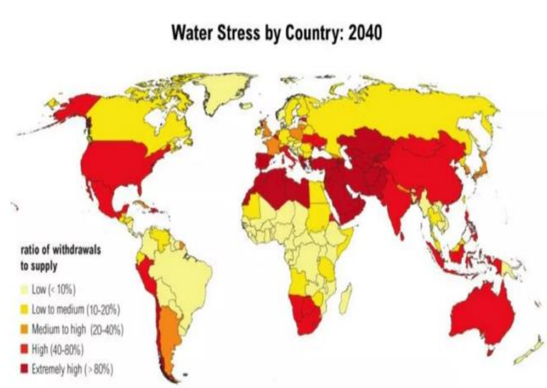


Figure 1 Locations of existing, emerging & considered carbon pricing instruments (2016); Source: World Bank Group



Source: BP; Qamar Research

- Qatar, UAE, Kuwait, Saudi Arabia, U.S., Algeria and Egypt figures for 2014, the remaining for 2013
- UAE and Morocco the most active when it comes to environmental issues
- MENA region is particularly vulnerable to climate change and is one of the world's most water-scarce and dry regions

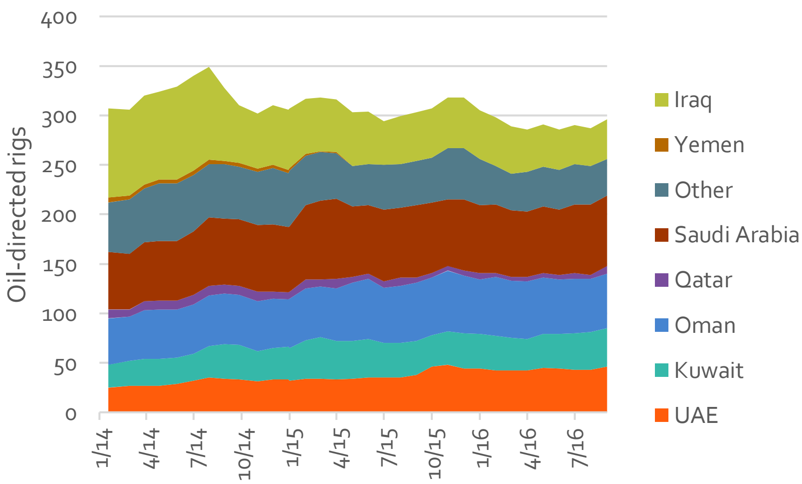


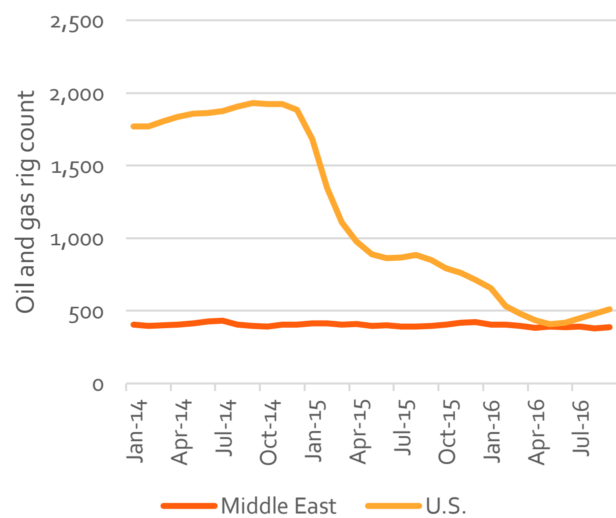
Source: Global Risk Insights

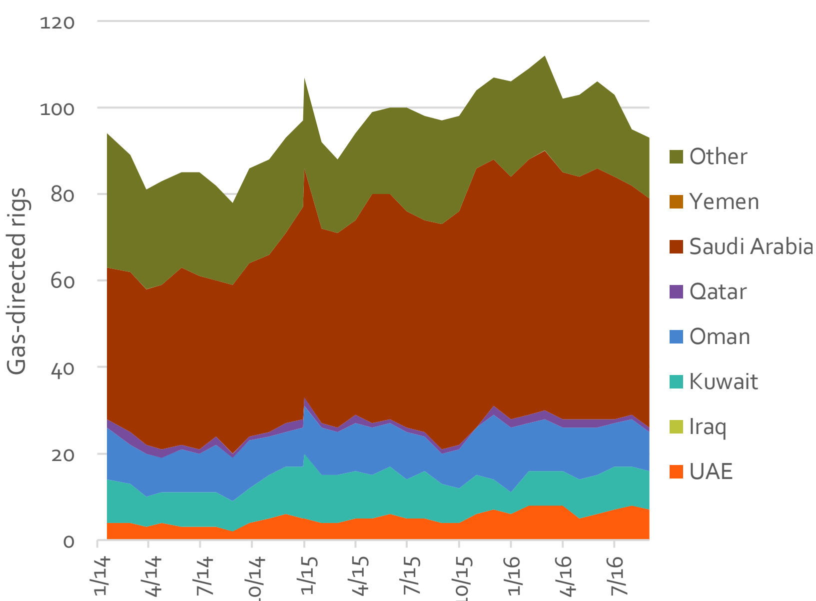
Rig count snapshot

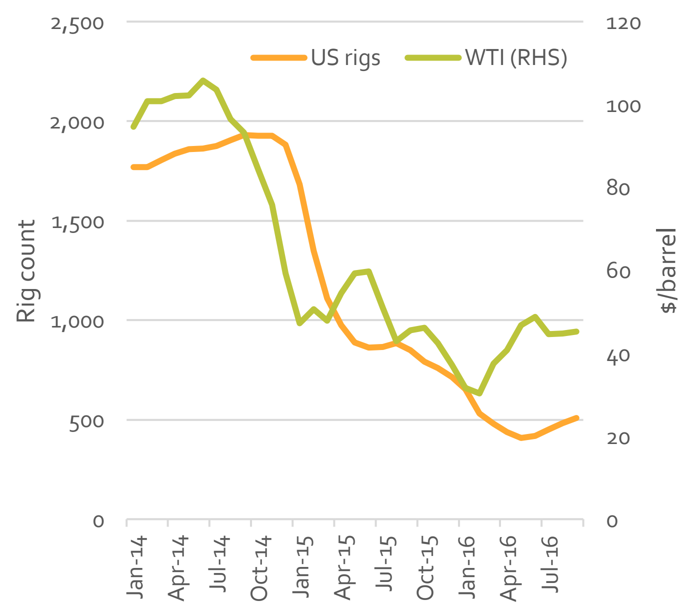
- Middle East oil-directed drilling remains strong, with the exception of Iraq
- Iran is the most active driller - 57 active rigs in September 2016 (OPEC October monthly report)
- UAE added 3 oil rigs this month

- US oil-directed rig count closely tracks oil price (with a 3-month lag)
- September rig count US (28 new rigs from August) vs Middle East (7 new rigs from August)









Rig Count data: Baker Hughes; Oil price data: EIA

Fuel prices and subsidy reform

The UAE was the first GCC country to remove fuel subsidies in August 2015. The other GCC countries, Saudi Arabia, Oman, Bahrain, Qatar and Kuwait have reduced subsidies.

The following table represents October 2016 gasoline and diesel pump prices ($/litre) in the GCC countries.

	Old ($/litre)		New ($/litre)	
	Gasoline 95	**Diesel**	**Gasoline 95**	**Diesel**
Saudi Arabia	0.16	0.07	**0.24**	**0.12**
UAE	0.45*	0.47*	**0.46**	**0.48**
Qatar	0.37*	0.37*	**0.37**	**0.38**
Bahrain	0.27	0.42	**0.42**	**0.42**
Kuwait	0.21	0.36	**0.34**	**0.31**
Oman	0.46	0.39	**0.46**	**0.47**
US (Pre-tax)	0.57	0.54	**0.53**	**0.51**

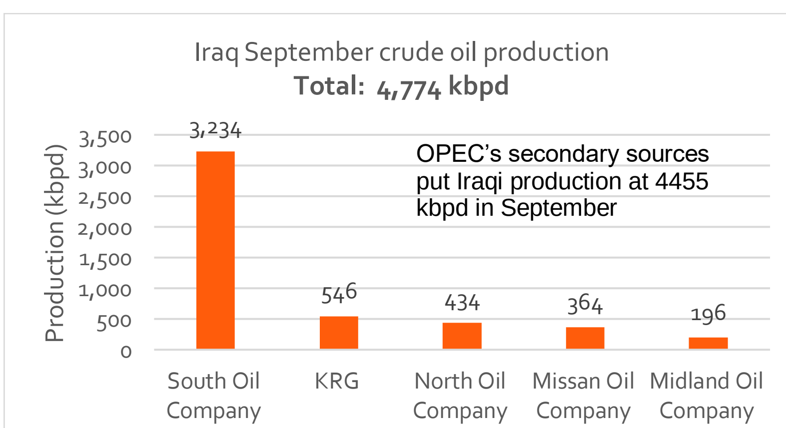
**Previous month prices; Source: EIA; News Sources*

OPEC Watch

Strategy	Comments
Organization changes	• The group appoints new secretary general, Nigeria's Muhammed Barkindo, effective 1st August 2016 • Confirmed the re-entry of Gabon in June 2016 since it left in 1995; current production at 211 kbpd in Sept. 2016 • Re-entry of Indonesia in January 2016 – current production at 722 kbpd in Sept. 2016
Support from non-OPEC	• **Russia freeze?** President Vladimir Putin says Russia ready to join OPEC effort to limit oil supply; Russia can "in theory" reduce oil output by 5%, Russian Deputy Energy Minister Kirill Molodtsov said
Production limit	• OPEC agreed to limit production to 32.5-33 Mb/d • Implementation of the ceiling to be decided in Vienna in November • Iraq does not want to join OPEC cuts, arguing it badly needs oil revenue to fight IS in Mosul insisting that 4.77 Mb/d should be the basis for their allocation; would they be exempt? Briefing journalists on its claimed higher production levels • Iran argues it should be exempt from production cuts until it recovers after EU sanctions lifted • Confirmed exempt countries: Venezuela, Nigeria, Libya • Pressure is on Saudi Arabia to cut production

Robin Mills talks on OPEC:

1. Money Talks: Crunch time for OPEC, interview with Robin Mills
2. Analysis of the OPEC cuts - when they'll kick in, and which countries will reduce production
3. OPEC-Russia Roadshow Heads to Vienna



Source: Iraq Ministry of Oil

Key MENA Energy Scorecard

MENA energy price reform	🟢	⇔	Kuwait govt. will subsidise 75 litres of fuel a month for its citizens, which was about 30% of the original price increase that became effective in September; Government dismissal in Kuwait over fuel subsidy debate
MENA unconventional oil & gas	🟠	⇔	BP assessing expansion of Khazzan to 1.5 Bcf/d; Aramco planning to invest $334 billion by 2025 on its shale gas programme and other oil and gas projects; Much of additional gas supply in Saudi from 2020 onwards likely from unconventional gas resources; Phase 1 BP Oman's Khazzan project 80% complete and on track to deliver first gas near the end of 2017 with 38 of the initial 50 wells drilled
MENA alternative energy	🟡	↑	Palestine Investment Fund invites bidders for a 5MW PV solar facility; Saudi Electricity Company is expected to send out tender documents for the prequalified bidders for the 50MW solar plants north of the kingdom by end of October (projects to be developed under IPP model); Dubai invites interest for first CSP project (200MW) as part of the target of 1000MW CSP capacity by 2030; Abu Dhabi receives world record solar bid on the Sweihan 350MW PV project (IPP) at $0.0242/kWh; Jordan removed the 5MW limit on nameplate capacity of solar plants connecting to the power grid
MENA nuclear power	🟡	↑	Abu Dhabi's nuclear project (Barakah nuclear power plant) reaches financial close on the $24.4bn project; Jordan's $10bn 2GW atomic power plant still in feasibility stage, to be completed in 2017
Energy infrastructure security	🟠	↑	IS attacked the Qayarah and Najmah oil fields with more than 6 wells on fires after being driven out of the Qayarah field in August, but lost control of the Shirqat field; Libya resumed production at the key Waha oilfield bringing overall production to 580 kbpd; Libya targeting 900 kbpd production by year end, depending on the restart of major oilfields El Sharara and El Feel; Niger Delta Avengers attacked Chevron Escravos pipeline
OPEC production	🟡	↑	OPEC crude output increased to 33.394 Mb/d in September from 33.174 Mb/d in August; OPEC agreed to limit its production to 32.5 -33 Mb/d; real challenge of the Algiers agreement will be deciding who cuts back & by how much
East Mediterranean gas commercialisation	🟡	↑	Jordan's National Electric Power Company signed a $10bn agreement to import 1.6 Tcf of natural gas from Israel's Leviathan field over 15 years; Israel and Turkey discussing gas pipeline to pump Israeli gas to Europe; Bulgarian and Greek pipeline (Interconnector Greece - Bulgaria (IGB)) proposed gas pipeline to start next year to reduce dependence on Russia; Greece, Cyprus and Israel discuss 1300 km, 16 BCM/year pipeline for East Med gas to Greece - feasibility study due to be presented next month
Egypt energy reform	🟠	⇔	Oil and electricity subsidies reached peak of EG£139.5 billion in the 2013-14 fiscal year, and have fallen to EG£62.4 billion in the 2016-17 budget, about 2% of GDP, partly due to subsidy cuts but mostly because of falling oil prices
Kuwait developments	🟡	⇔	Kuwait ruler dissolves parliament; national oil companies of Bahrain, Kuwait and Saudi Arabia established new group to support companies in the refining industry: Gulf Downstream Association; KNPC receives bids for sulphur treatment facility in Mina al-Ahmadi refinery with Sinopec submitting the lowest bid
Abu Dhabi developments	🟡	↑	ADNOC plans to merge two offshore oil companies: ZADCO and ADMA; ADNOC to merge three shipping service companies: Abu Dhabi National Tanker Company (ADNATCO), Petroleum Services Company (ESNAAD) and Abu Dhabi Petroleum Ports Operating Company (IRSHAD); Taqa issues bonds worth $750mn; Abu Dhabi Investment Authority acquires 16.7% stake in Scotia Gas Networks
Iraqi Kurdistan (KRG) developments	🟠	⇔	KRG produced average 564,808 b/d in September compared to 411,727 b/d in August; increase from restart of Bai Hassan field in Kirkuk after attack by IS at end July; KRG oil sold at average price of $36.1/bbl, bringing revenues of $327.6mn in September
Federal Iraq developments	🟠	⇔	Kuwait Energy started production at new well in Block 9 at 5,600 b/d; 12 oilfields in central and southern Iraq offered to 19 prequalified companies; Iraq plans to tender 4 new refineries: Kirkuk, Kut, Samawah and Basra; exports increased slightly to 3.276Mb/d in Sept., from 3.229 Mb/d in August
Iran developments	🟡	↑	Iran increased production to 3.665 Mb/d from 3.643 Mb/d; NIOC invited companies to prequalify to bid for upstream oil and gas exploration and production tenders with deadline in November; US allowed dollar-denominated transactions dealings with Iran; Iran economy forecasted by IMF to grow 4.5% in 2016/17 from sanctions relief; Lukoil in discussions with NIOC for development of Ab-Teymour and Mansouri oil fields

🟢	Very positive	↑	Improvement in last month
🟡	Positive	⇔	No change
🟠	Negative	↓	Deterioration in last month
🔴	Very negative		

b/d = barrels per day
Bcf/d = billion cubic feet per day
Tcf = trillion cubic feet
mcf/d = million cubic feet per day
Mb/d = million barrels per day
kbpd = thousand barrels per day

About Qamar Energy

Robin Mills, Non-Resident Fellow for Energy, Brookings Doha Center, speaking at Brooking Doha Centre event:

The Impact of Low Oil Prices and Taxation on the GCC Countries

Risky routes: Energy transit in the Middle East

Robin Mills

CEO

Robin established Qamar Energy to meet the need for regionally-based Middle East energy insight and project delivery. He is an expert on energy strategy and economics, described by Foreign Policy magazine as **"one of the energy world's great minds".**

Prior to this, he led major consulting assignments for the EU in Iraq, and for a variety of international oil companies on Middle East business development, integrated gas and power generation and renewable energy.

Robin worked for a decade for Shell, concentrating on new business development in the UAE, Qatar, Iraq, Iran and other Middle Eastern countries, when he was described as the "Shell expert on Iran".

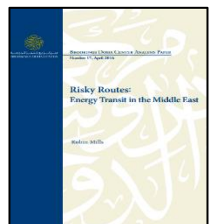
He subsequently worked for six years with Dubai Holding and the Emirates National Oil Company (ENOC), where he advanced business development efforts in the Middle East energy sector, including major gas import schemes for Dubai and upstream developments in Iraq, Qatar, Yemen, Pakistan, Turkmenistan, Algeria and elsewhere.

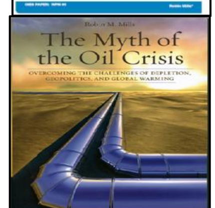
He is the author of two books, *The Myth of the Oil Crisis*, which evaluates global long-term oil supply, and *Capturing Carbon*, the first comprehensive overview of carbon capture and storage for the non-specialist. He is the columnist on energy and environmental issues at The National newspaper (Abu Dhabi), and comments widely on energy issues in the media, including Foreign Policy, the Financial Times, The Atlantic, CNN, CNBC Arabiya, BBC, Al Jazeera, Bloomberg, Sky News and others.

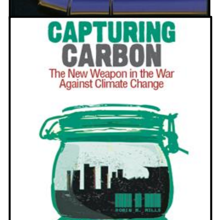
Robin also authored a ground-breaking study, *Sunrise in the Desert: Solar becomes commercially viable in MENA*, of solar power competitiveness in the Gulf (with PWC/Emirates Solar Industry Association) as well as the study *Under the Mountains: Kurdish Oil and Regional Politics* for the Oxford Institute for Energy Studies and *Risky Routes: Energy Transit in the Middle East* for Brookings Doha Center.

He is Non-Resident Fellow for Energy at the Brookings Doha Center. He holds a first-class degree in Geology from the University of Cambridge, and speaks Arabic, Farsi, Dutch and Norwegian.

Click on publication for more information







Robin Mills receives the 2016 'Energy of Words' at the Global Energy Prize in St. Petersburg, Russia.

For prize announcement click here