Above: Solar Energy in the Middle East needs a bright strategy soon. Photo: File

ENERGY CONSULTING & PROJECT MANAGEMENT
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Photo:File

A tentative relationship forms between Oman and Iran based on mutual interdependence. Page 2

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The delayed dawn of Solar Energy in the Middle East

While solar panels are now a standard feature of urban roofscapes in cloudy Germany and Britain, they are almost invisible in the sunny Gulf. *By Robin Mills*

On Saturday 29th March, Burj Khalifa dimmed its lights to mark Earth Hour, along with millions of people across the region. But when it comes to solar power, the Middle East needs to turn the lights on.

Germany, the world's leading solar market, has had a bad year in 2014 – it installed only 3.3 gigawatts, less than half the year before. Yet across the whole Middle East, excluding Turkey and Israel, there are not even 0.2 gigawatts of solar capacity. In conventional power, mostly from burning gas, the UAE alone has more than 20 gigawatts.

Current circumstances are uniquely favourable for expanding solar power. Photovoltaic (PV) costs continue to fall, making it ever more attractive than oil or expensive imported gas. Solar power these days is not a particularly complicated technology, and does not have the safety and political challenges of nuclear reactors. There is a wealth of operating experience from around the globe. With cuts to subsidies elsewhere and the industry struggling with overcapacity, solar companies are searching eagerly for the next big market.

Abu Dhabi's ground-breaking Shams-1 solar plant was inaugurated almost exactly a year ago. But it has taken a long time for its successor to emerge: companies first bid for Noor-1 in 2011. But with regulations remaining unclear, it is now unlikely that the project will even go ahead this year.

Dubai started later but is catching up fast, based on a sound and cohesive regulatory regime, leadership support and a long-term, step-by-step plan. The next phase of the Mohammed bin Rashid solar park near Bab Al Shams should be ready next year. And energy-poor Jordan is also doing well, showing investor-friendly continuity and concluding its first large agreements last week.

Both Dubai and Abu Dhabi have been working on regulations for householders to install their own PV systems, with Abu Dhabi running a small pilot project. But while solar panels are now a standard feature of urban roofscapes in cloudy Germany and Britain, they are almost invisible in the sunny Gulf.

Saudi Arabia has been even more frustrating. In 2012, the kingdom announced plans for some 40 gigawatts of solar power, costing US$109 billion, in the period up to 2030. The King Abdullah Centre for Atomic and Renewable Energy then ploughed through an extensive process of consultation– aiming not only to generate solar power, but also to create local industries and employment. Still, the Middle East Solar Industry Association believes the policy and funding framework needed to light up the Saudi solar programme is not in place, and unlikely to appear this year.

Such unfulfilled expectations are dangerous. **Solar companies – often struggling with poor margins elsewhere and without the deep pockets of oil companies – set up in the region but lose faith and withdraw staff after waiting years for projects.** It will be harder to entice them back next time.

One of the lessons from the German experience has been that it is vital to create an ecosystem of solar developers, suppliers and installers, to reduce costs and ensure consistent quality. This will not emerge while solar companies continue to struggle with stop-start activity. Much better a steady stream of smaller projects, than an expected tidal wave that never arrives.

Middle East governments need to set consistent policies and pricing schemes, not ad hoc provisions, to allow solar power to compete fairly. If subsidies on electricity prices are not removed, at least they should be made transparent so householders and businesses can make an economically sensible decision on installing solar panels.

Conditions have never been more favourable for the solar industry to boost the region's energy supply, environment and economy. But the Middle East needs to find more responsive and flexible commercial models, or the lights will stay off on its solar dawn.

Oman-Iran talks: A gas duet

Gandhi said: "Interdependence is and ought to be as much the ideal of man as self-sufficiency." *By Robin Mills*

Gandhi may not have been thinking of energy security. But the signature of a gas pipeline deal during the Iranian president Hassan Rouhani's recent visit to Oman shows the importance of mutual interests in energy diplomacy.

From Oman's point of view, the pipeline is of crucial importance. It will carry 1 billion cubic feet per day of gas from Rudan in southern Iran, across the Gulf of Oman to the petrochemical centre of Sohar. Oman today produces a little less than 3 billion cubic ft. per day. But its domestic gas demand is rising sharply, and a new US$15bn industrial zone at Duqm on the south-east coast will boost consumption further.

The Sultanate's liquefied natural gas plant has been running below capacity because of shortages of feedstock, losing valuable export revenues. By 2018, BP's Khazzan field is expected to deliver a further 1 billion cubic ft, but it is a technically challenging and expensive project that might easily suffer delays. Diplomatically, Mr Rouhani's offer can be seen in two ways. It may be another cunning ploy to divide the GCC, after the recent dispute between Qatar on the one hand and Saudi Arabia and the UAE on the other. Oman has played an important mediating role in US diplomacy with Iran and has long been discussing gas imports with Tehran.

In a more positive light, the pipeline deal could be seen as an outreach from Iran to build more constructive relations with the GCC. All of its Arab neighbours, bar Qatar, have at some point discussed buying Iranian gas. The pipeline still faces some significant challenges. Oman is supposed to finance the $1bn cost of its section. Although not the most technically challenging project, the pipeline will have to cross waters of several hundred metres' depth in the Gulf of Oman. International financial institutions and engineering contractors will not take part until sanctions on Iran are substantially eased. The Omanis will remember previous failures, such as the Iranian pipeline to Sharjah that never delivered gas, dogged by technical failures and allegations of corruption and under-pricing. A pipeline to Pakistan remains incomplete as sanctions prevent the Pakistanis' financing their half. Rudan is not yet connected to the Iranian gas network, and it is not clear which fields will source the new gas. Most crucially, the price of that gas has not yet been agreed, the same problem that has dogged all previous Iranian gas deals, and one that makes Mr Rouhani's "signature" rather theoretical. It's like negotiating your new house's wallpaper and the plants in the garden before discussing the purchase price.

In the past, Iran has always priced its gas too expensively, given its neighbours' concerns over dependence on it, it's somewhat shaky reliability on deliveries to its main customer Turkey, and the complications of sanctions. It remains to be seen this time whether Tehran can concede on price to gain a valuable economic and political success.

This deal also illustrates the dictum of Gandhi's great adversary, Winston Churchill, that for energy security, **"Safety and certainty lie in variety and variety alone". Oman does not want to rely only on Qatar or its new unconventional gas resources. A deal with Iran creates a competitive dynamic the Omanis can use against other potential suppliers.**

Even before the United States got started, Iran had sanctioned itself – by its failure to sign mutually beneficial deals with its neighbours. Although the sultanate may appear to grow more dependent on the Islamic Republic, the reverse is also true. "Energy independence" is a mirage – true security is assured by a network of inter-relationships.

Lebanon: The licensing round that could be

Lebanon's Petroleum Administration met again last week with the new cabinet of Prime Minister Tammam Salam for further discussions on the launch of the country's long-awaited offshore licensing round. *By Gary Lakes*

What began with a great deal of fanfare from the Ministry of Energy and Water in early 2013 and considerable interest from major international energy firms – not to mention public excitement – has slipped during the normal course of Lebanese politics into just one of those things. Forty-six companies have pre-qualified to participate in the licensing round, but it remains to be seen if their interest in the Lebanon offshore remains intact.

With a new government in place, the election of a new president due within weeks, and the passage of two long-delayed decrees reported to be imminent, Lebanon could still pull off a successful licensing round. Further involvement in neighbouring Syria's civil war and the war's spread into Lebanon could prove to be discouraging – but the exploration work will be taking place offshore.

Early April, Minister of Energy and Water, Arthur Nazarian, announced that the closing date for the licensing round would again (for the fourth time) be postponed. The new closing date was rescheduled from 10 April to 10 Aug. With a working cabinet now in place the approval of two decrees needed for bidding to proceed is expected to happen soon and allow sufficient time for the pre-qualified companies to deliver their proposals.

The problem is that the working cabinet has a lot of work to. The government is foremost concerned with bringing about the presidential election which must take place within the coming weeks. Since March, the Council of Ministers has been occupied with a number of long-pressing domestic issues, the fighting in neighbouring Syria, its frequent spillover into Lebanon, and the crisis created by the rising number of Syrian refugees.

During one of the first cabinet meetings in early April, a ministerial committee was established to work with the PA to review the two decrees before they're presented for approval. Also being prepared is a tax law that will regulate any future revenue from hydrocarbon sales.

The decrees are crucial for the procedure. One decree concerns the model exploration and production agreement (EPA), the other covers the delineation of 10 offshore blocks demarcated within Lebanon's 22,730 square kilometre exclusive economic zone in the East Mediterranean.

Lebanon was without a functioning government since Mar 2013 and the decrees could not be approved by the acting government, forcing the closing date for the licensing round – which had opened in Feb 2013 with a pre-qualification round – to be postponed thrice.

Among the 46 companies pre-qualified to participate in the licensing round are many industry players. US majors ExxonMobil, Chevron, Anadarko, Brazil's Petrobras, the UK's Shell, Eni of Italy, Total of France, Norway's Statoil, Denmark's Maersk, Spain's Repsol, Petronas of Malaysia and Japan's Inpex have been selected to bid as operators in the licensing round. Remaining companies will be partnered with the operators in bidding groups.

Should the decrees be passed in the next few weeks, that will allow the bidding groups at least three months until the 10 Aug deadline to make a final assessment of the seismic data and submit their proposals to the Ministry of Energy and Water for review. Lebanon has gathered extensive offshore seismic data that has led to speculation that significant deposits of natural gas and crude oil exist within Lebanon's EEZ.

There is as yet no schedule for the review and selection of preferred bidders, but blocks will likely be awarded in early 2015.

So far, the ministry has identified five blocks that will be offered in the tender – Blocks 1, 4, 5, 6 and 9. But that could change as the cabinet has the right to determine the number of blocks that will be tendered. Some of Lebanon's politicians have recommended that all the blocks be included in this first bidding round, others have called for only a couple to be included.

A problem could arise over the demarcation of Blocks 8, 9 and 10. The southern edges of those three blocks extend into an 854 square kilometre zone that is disputed with Israel. During a recent meeting to Beirut, US energy diplomat Amos Hochstein urged the Lebanese government to refrain from exploring until an agreement could be arranged with Israel over the status of the blocks. A recent media report from Beirut identified the disputed zone as Block 23, suggesting that Blocks 8, 9 and 10 might be redrawn.

35 trillion cubic feet (Tcf) of natural gas has been discovered offshore Israel, but Israel has not awarded licenses or carried out exploration within the disputed area. The US has been attempting to resolve the issue for the last couple years. At one point it suggested that the zone be divided between Lebanon and Israel, but the two countries rejected the idea.

Meanwhile, the partners in Israel's Leviathan gas field – US explorer Noble Energy, the Delek Group and Ratio Oil Exploration – have bid in a tender to supply natural gas to Cyprus through a pipeline.

The announcement of the Leviathan bid has revived speculation that Israeli gas could become involved in a LNG export facility that Cyprus plans to eventually build on its southern coast.

The tender was issued by the Natural Gas Public Company (DEFA) of Cyprus for the supply of natural gas and the installation of a delivery system for domestic power generation. The Leviathan partners stated that their bid was for 0.7-0.95 BCM/year of gas for an approximate 10 year period, but the fact that the group proposed the construction of a pipeline to Vassilikos, where the main power station is located and where the proposed LNG plant would be built, suggests that larger amounts of gas from Leviathan could be supplied if the planets align themselves correctly.

Noble and Delek are partners in Cyprus' offshore Block 12, where 3.6-6.0 Tcf of natural gas has been discovered, but that is not enough resource to proceed with the first train of the LNG project. More drilling – by Noble in Block 12, by Italy's Eni and France's Total– will begin this summer with the goal of finding more gas offshore Cyprus with a view of proceeding at some point in the future with the LNG project.

Cyprus energy officials met in early April with Noble and Delek representatives to resume talks about the LNG project. The parties signed last June a memorandum of understanding regarding a framework agreement for establishing the project. Originally meant to be operational in 2020, the lack of sufficient resource in Block 12 means that first LNG might not be produced in Cyprus until 2022 or later – unless gas from Israel's Leviathan field becomes a factor in the LNG project.

Key MENA Energy Issues Scorecard

MENA energy price reform	🟠	↑	Iranian President Rouhani tested his popular support as petrol prices were hiked from \$0.17 per litre to \$0.28 per litre. Oman's finance minister said the state needed to cut fuel subsidies; plans continue in Egypt and Libya
MENA unconventional oil & gas	🟠	⇔	Oil shale production in Jordan may start in 2018, to reach significant quantities by early 2020; Shell expected to start producing oil shale in 2022; Saudi Arabia boosted unconventional gas drilling plans
MENA alternative energy	🟡	↓	Middle East predicted to invest \$50 billion in solar energy, as Saudi Arabia plans to install 23 900MW of renewable energy by 2020; however progress so far is slow. First Solar, Shams Ma'an consortium secure 20-year PPA for 52MW Jordan project. Egypt announced plans to invest \$1 billion to develop several major solar energy projects.
MENA nuclear power	🟡	⇔	Dubai has clarified it will not build its own nuclear power plant but will seek to secure electricity from nuclear reactors coming up in Abu Dhabi
Energy infrastructure security	🟠	↓	Attacks on pipelines and power lines in Marib, Yemen; insurgents in Iraq control stretches of pipeline in Ninewa province near Salahaddin border cutting off access, and forcing suspension of exports via northern pipelines to the Turkish port of Ceyhan
OPEC production	🟠	↓	OPEC crude production dropped to the lowest in three years in April, led by declines in Saudi Arabian and Iraqi output, a Bloomberg survey showed. Production slipped by 302 000 barrels a day to an average 29.863 million, the lowest level since June 2011
East Mediterranean gas commercialisation	🟡	⇔	An export scheme for East Mediterranean gas has been proposed which among others includes a pipeline to Greece via Cyprus and Crete, with marine distances of 745-950 miles, depending on routing. Lebanese bid round still stalled. Israeli companies sign MoU with Union Fenosa for gas exports to Egypt
Kuwait energy projects progress	🟠	⇔	Kuwait plans to award a \$4.3 billion contract later this year for the first phase of a project to produce heavy oil at its northern Ratqa field, the head of Kuwait Oil Company said to the press
Abu Dhabi concessions renewal	🟠	↓	CNPC has established a field development joint venture with ADNOC. According to the Energy Minister, US and European IOCs have a "good chance" of winning renewals for concessions. ExxonMobil though will not bid for the ADCO renewal.
Baghdad-Erbil oil agreement	🟠	↑	Kurdistan has agreed to use its pipeline to export crude oil produced by federal North Oil Company. Kurdistan's Ministry of Natural Resources and NOC will work together to commission a new 36-inch pipeline. However election season will delay further resolution
Iraq oil production build-up	🟡	↑	Iraq's oil exports rebounded in March going higher than Saddam Hussein era with 75mb of oil exported in April despite insurgencies
Egypt subsidy reform	🔴	⇔	Planning minister Ashraf al-Arabi says Egyptian government was seeking advice from international institutions on restructuring subsidy and taxation systems
Iran news and oil sanctions	🟡	↑	Pakistan Prime Minister Nawaz Sharif to visit Iran on 11th May to discuss Iran-Pakistan gas pipeline; Iran shows enthusiasm to supply natural gas to Europe to wean them off Russian energy; Tehran's annual oil and gas fair opened on 6th May with 600 companies seeking opportunities if sanctions are lifted

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

Energy Prices and Generation Costs in the Middle East

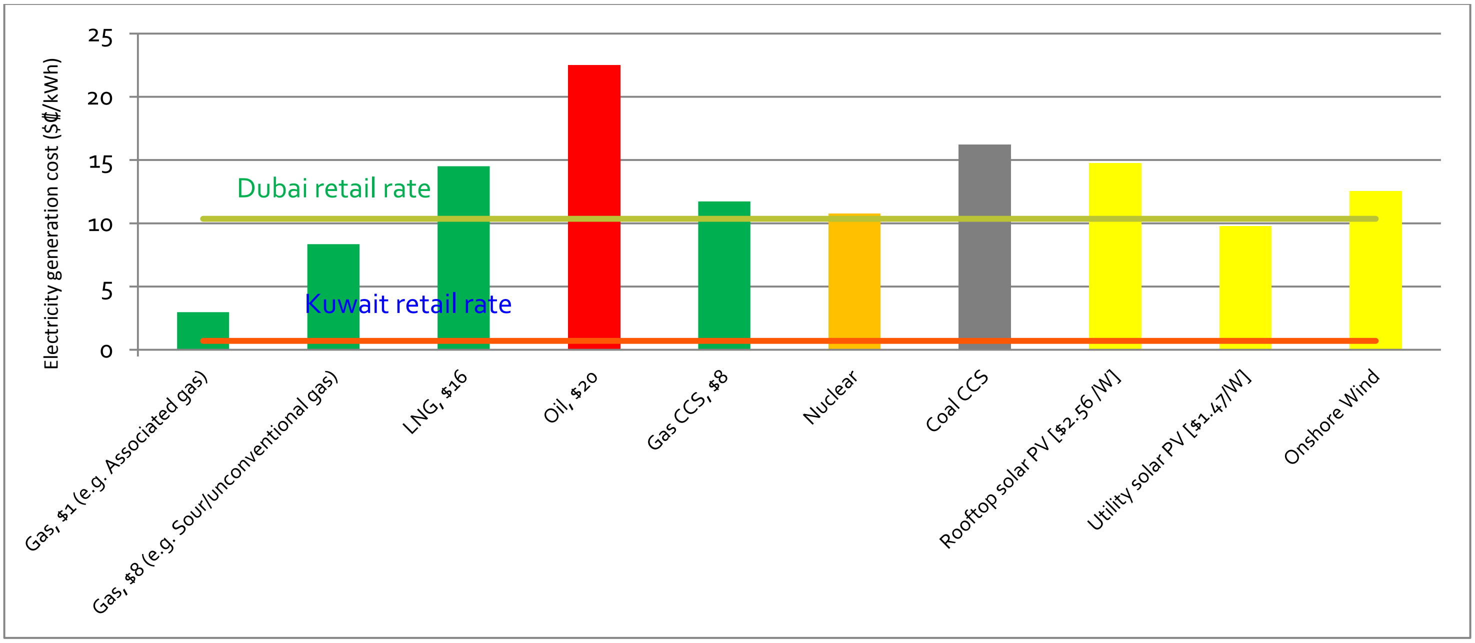
The following table represents February 2014 gasoline, diesel and electricity prices (top rate for residential consumers) in selected MENA countries, with the US for comparison, and the direction of change since last month.

		Gasoline ($/Litre)	Diesel ($/Litre)	Electricity ($¢/kWh)
Saudi		0.21	0.09	6.9
Qatar		0.25	0.25	2.7
Bahrain		0.27	0.26	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

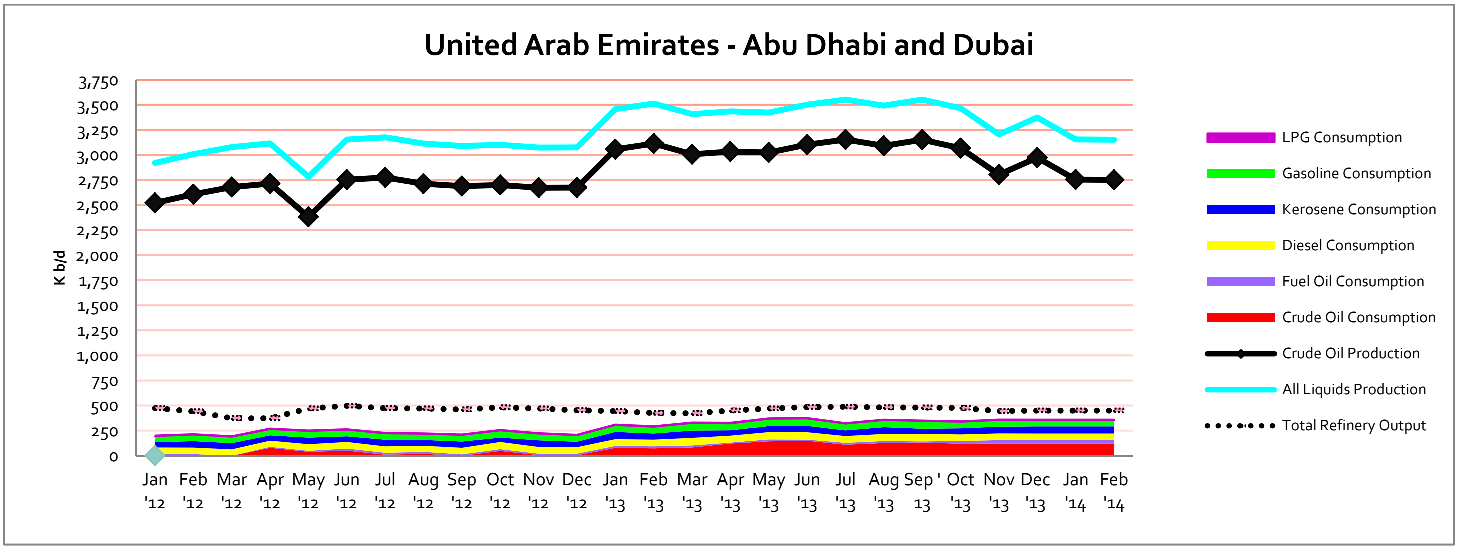
	Gasoline ($/Litre)	Diesel ($/Litre)	Electricity ($¢/kWh)
Egypt	0.59	0.46	6.8
Iran*	0.7** ↑	0.35** ↑	1.64**
US	*0.87*↓	*1.027*↑	*12.61*
Lebanon	0.878 ↓	0.87	13.3
Jordan	1.4 ↑	0.98 ↑	33.2

* Non-subsidized allocation, at current (volatile)
** Values changed mainly due to changes in the exchange rate
Open-market exchange rate (US$1:IR 24942)
Note: Gasoline & diesel are pump prices. Only the US, Lebanon and Jordan prices can be considered non-subsidized.

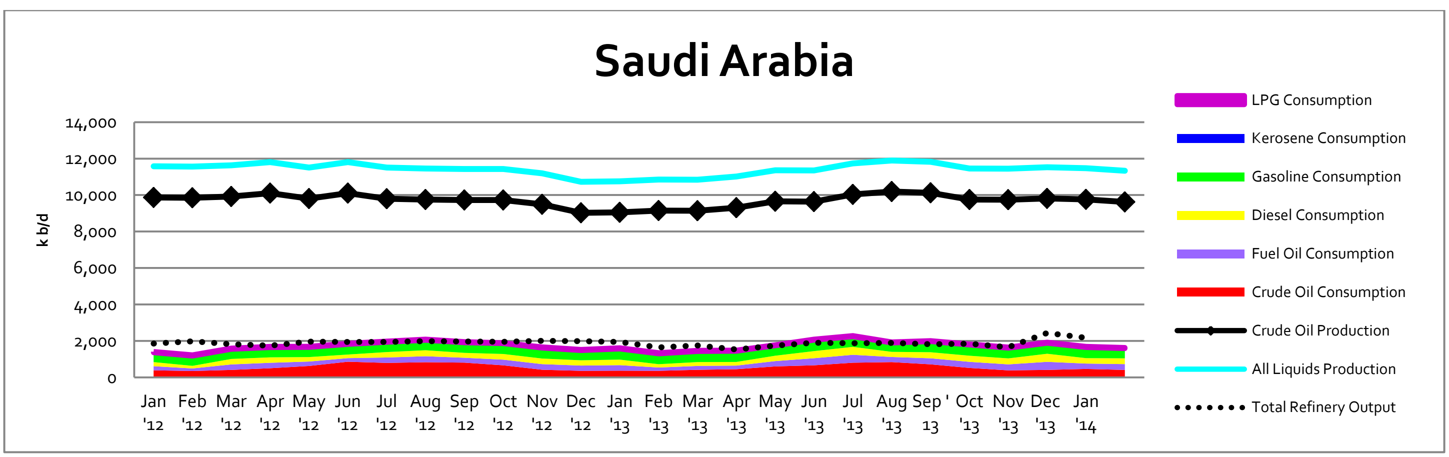
Source: Gulf Oil Review; Manaar research



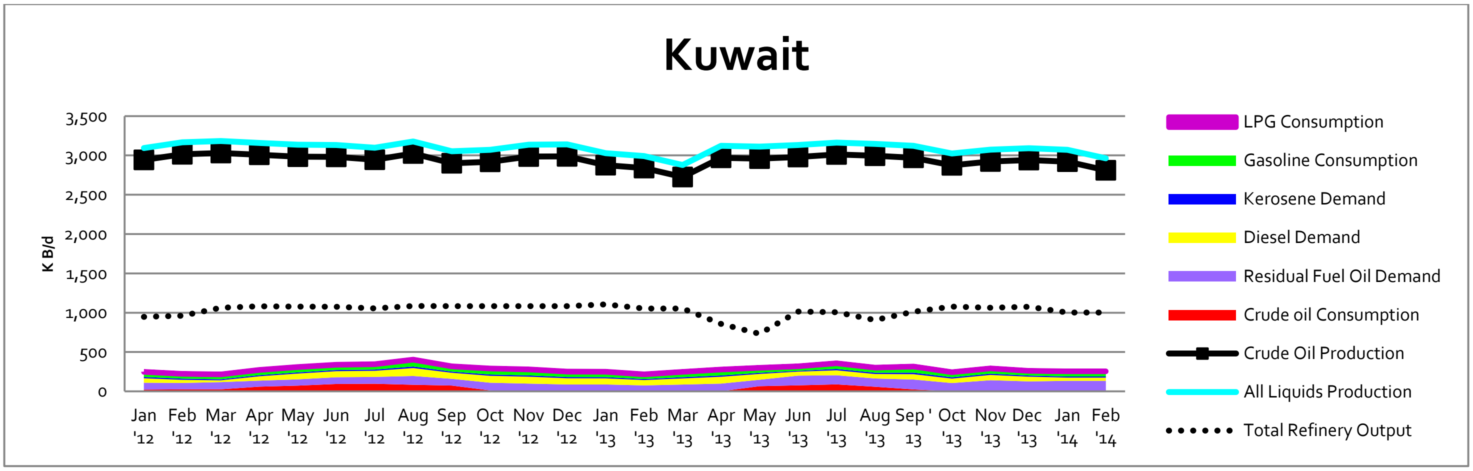
Regional Energy Statistics



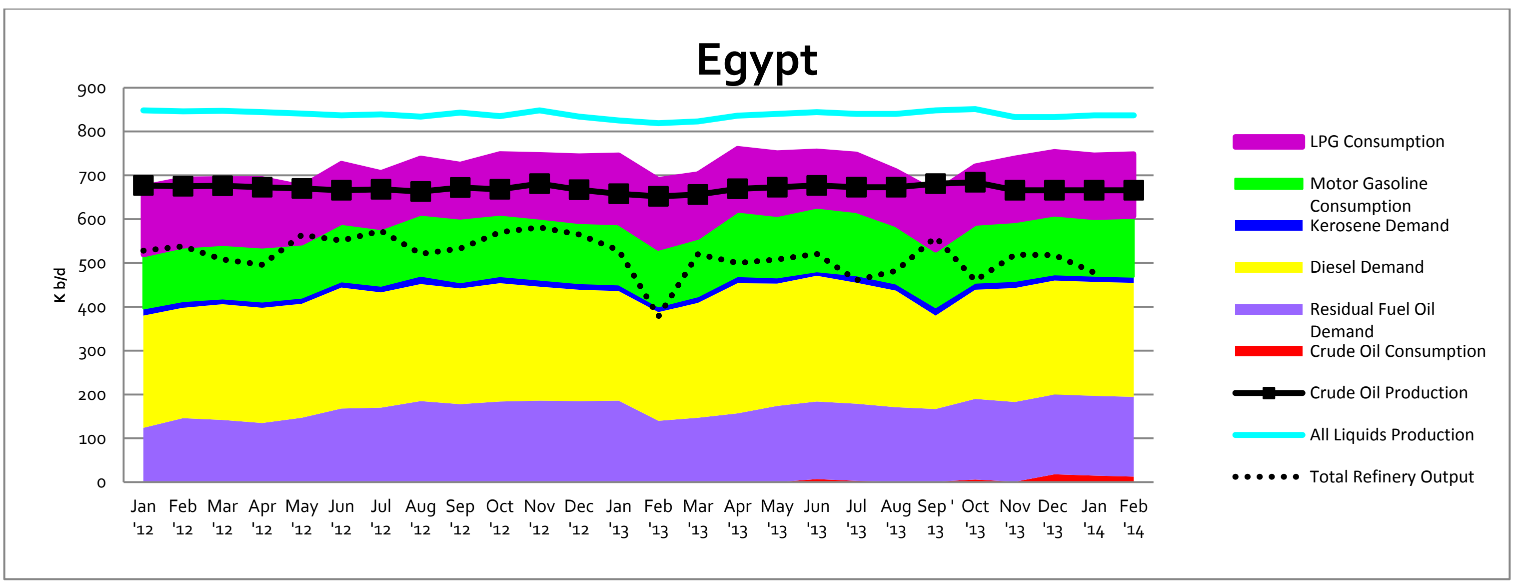
- UAE plans to raise its oil production capacity to 3.5 million barrels per day by 2020 to meet growing demand.



- Saudi Arabia produced 9.566 million barrels per day (bpd) of crude oil in March, down from 9.849 million bpd in February 2014.

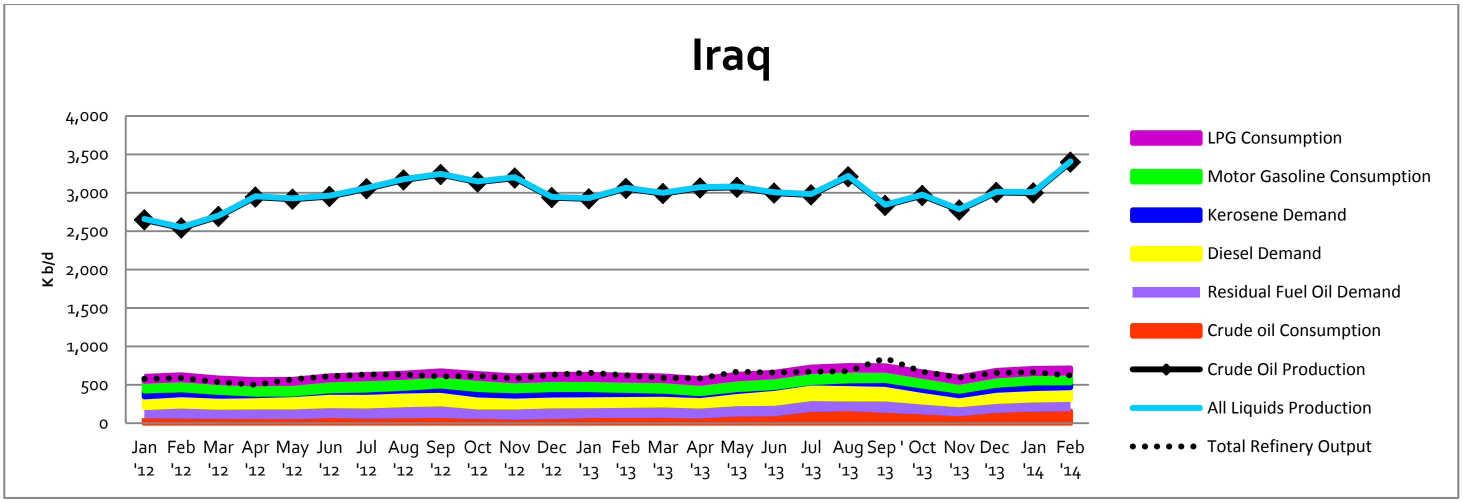


- Kuwait has increased its oil production capacity to 3.3 million barrels of oil a day (bpd) and is hoping to reach 3.5 million bpd in 2015.
- The Al Zour refinery will begin construction in June, which will be a major part of Kuwait's economic development plan to upgrade its infrastructure, and is expected to cost around $14.18 billion.

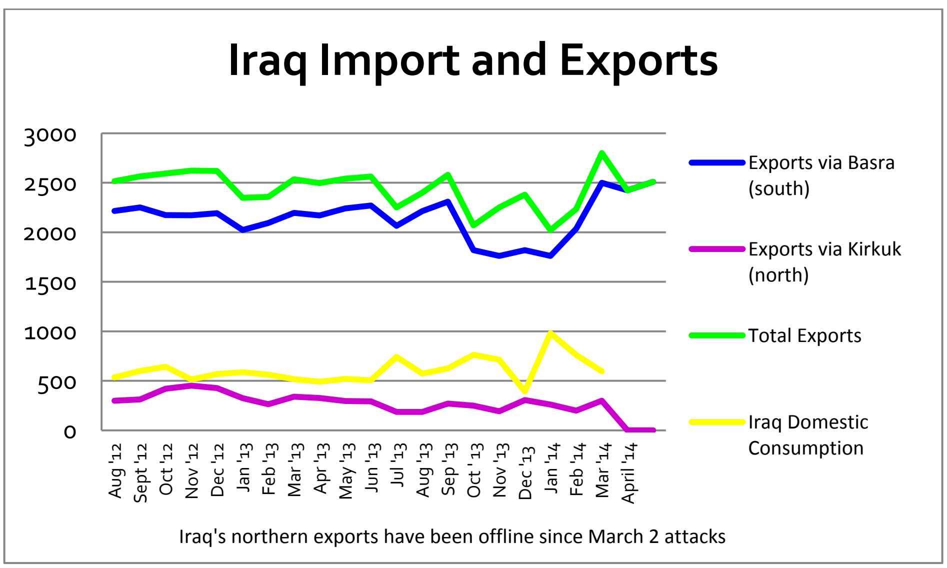


- Misdirected subsidies continue to hinder Egypt's progress in the oil and gas sector.
- Egypt has launched three bid rounds in the last two years to build floating liquefied natural gas import facilities, but has so far failed to conclude a deal.
- However, though gas production has fallen, crude oil production remains quite steady

Energy Statistical Report for Iraq



- Lukoil began production at West Qurna-2 on its way to a target of 1.2 million barrels, which would also help maintain geostrategic relations with Russia.
- Shell's Majnoon field (with SOC and Petronas), produced 210 kbpd, in excess of initial target 175 kbpd, achieving early cost recovery and first exports



Royal Dutch Shell reported the export of its first shipment from Iraq's Majnoon field under a 20-year contract.

Shell holds a 45 percent in the Majnoon service contract, now producing 210 000 barrels per day

Iraq News in Brief

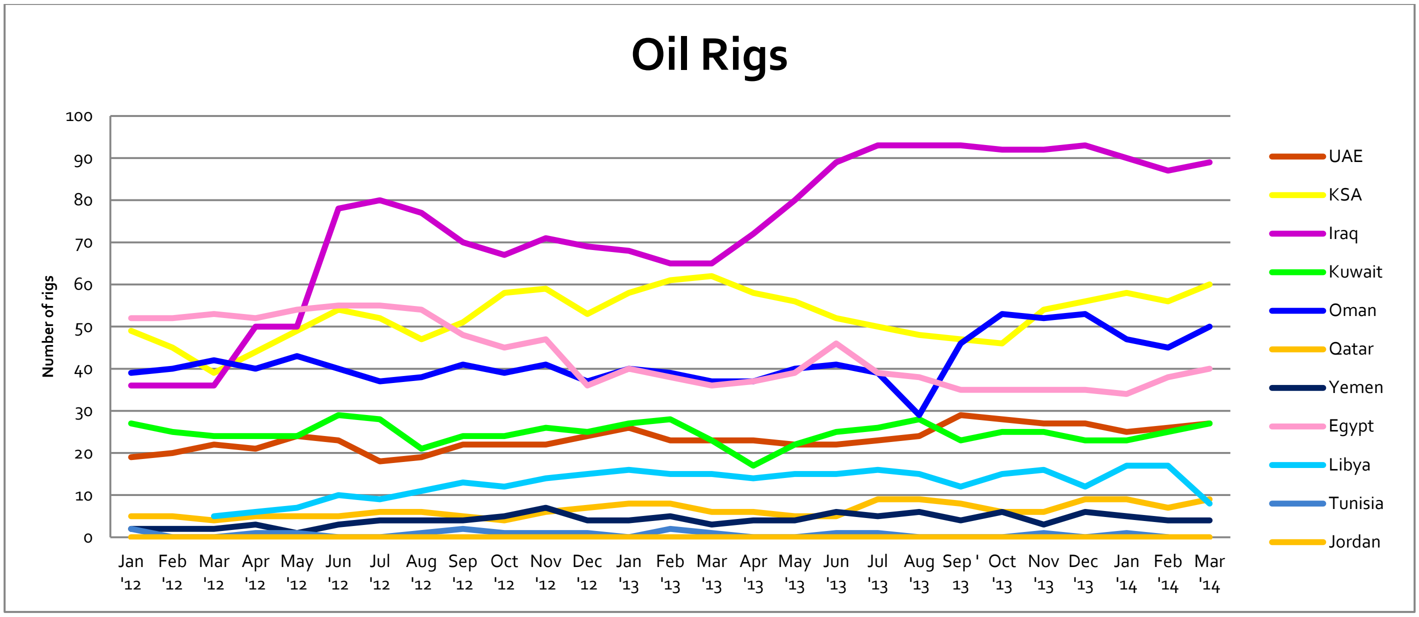
Russians poised to develop Nasiriyah oil field

Lukoil is considering a joint venture with Russian E&P company Zarubezhneft to develop the Nassiriya oil field and help build a refinery. The next round of talks on the project with the Iraqi government is expected in summer 2014, LUKoil CEO Vagit Alekperov said.

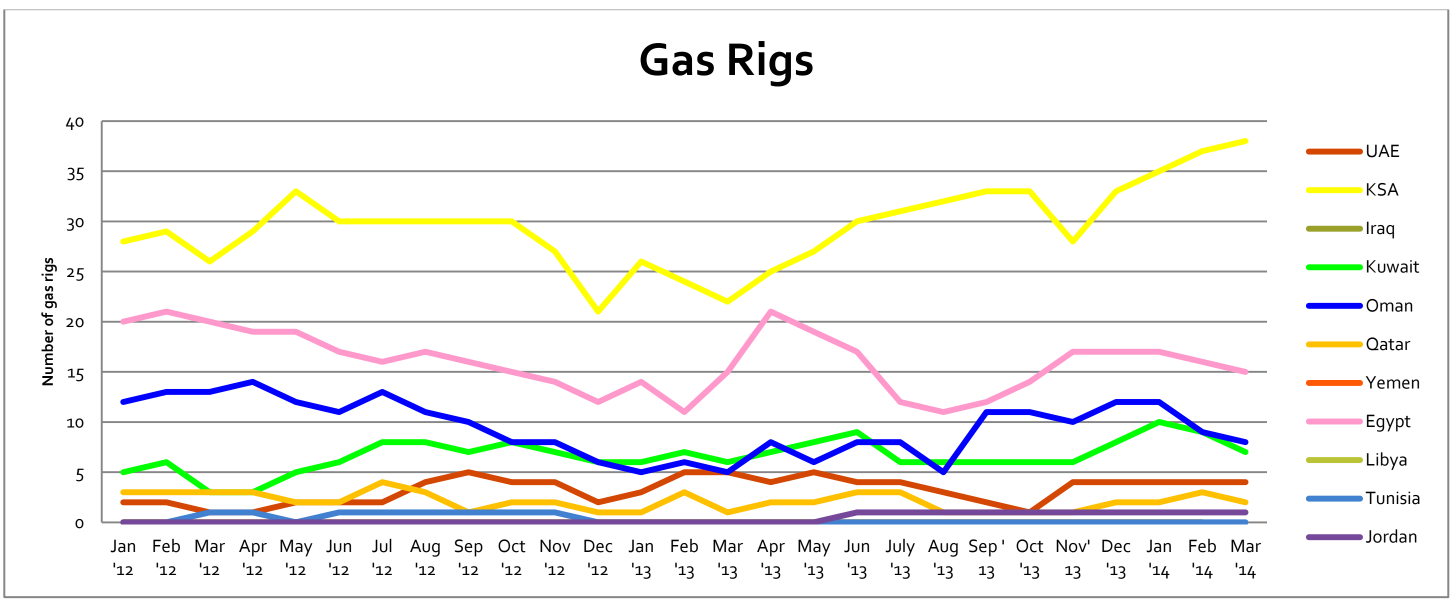
Kurdistan-Turkish pipeline flows to recovery

Kurdistan region has restarted independent pipeline exports of roughly 100 000 barrels per day (bpd) to the Turkish port of Ceyhan, in anticipation of first oil sales the month of May, after militants attacked, and stopped exports via Kirkuk.

Oil and Gas Rig Count



- The Abu Dhabi National Oil Company (ADNOC) has awarded the US's National Oilwell Varco a contract worth about $32m to provide an onshore drilling rig
- The International Energy Agency has announced that Iraq's oil exports have hit 3.6 million bpd, a record 30 year high, as rig count stayed at an average of 90 active rigs in 2014.
- Libyan drilling fell sharply as insecurity and export blockages continue



- Egypt plans to increase rig count by ending gas subsidies for the relatively wealthy industrial sector, and raising funds for energy investment.
- Egypt's Petrojet completed two gas compression facilities in Hammar Mishrif and Rafidhiya, Iraq on March 1st.
- Saudi Aramco is expected to award a major EPC contract on the Fadhili gas plant in the Eastern Province.
- BP made the first major contract award of 2014 with a $1.4bn deal for Khazzan's central gas processing facility in Oman.

Recent and forthcoming MENA Licensing Rounds

Country	Round	Launch Date	Blocks on Offer	km^2 offered	Blocks Awarded	Closing Date
Egypt	Ganope	Dec – 12	20	125,577	1**	
Jordan	South Jordan Block	April - 12	1	10,416	-	June - 13
Egypt	EGAS	Dec – 13	22	NA	-	May - 14
Iraq	Nassiriyah	Dec - 13	1			
Iraq	5th Licensing Round	NA	10	NA		NA
Lebanon	1st Licensing Round	May – 13*	10	17,901	-	Jan – 14*
Oman	MOG	Jan – 12	4	26,837	2	Aug – 12
Oman	MOG	Nov – 12	7	103,422	-	Jan – 13
Yemen	6th Licensing Round	Sep – 12	5	20,132	-	NA
Yemen	March 2013 Licensing Round	March – 13	20	222,812	-	May - 13

* Delayed due to government formation; expected July 2014 * Participating in the Ganope International 2012 Bid Round #1, Dragon Oil awarded 100% interest in shallow-water block 19 in the Gulf of Suez.

In Image

Photo: File

Current Studies

Hydraulic Fracturing

Manaar has recently updated its study of the market for hydraulic fracturing in the MENA region, with PacWest Consulting. The 2014 MENA hydraulic fracturing report addresses historical and forecasted frac demand, supply, utilization, constraints and trends for all MENA countries. Market coverage also includes current hydraulic fracturing projects, unconventional potential assessments, past and forecasted unconventional wells in Oman and Saudi Arabia, historical proppant volumes in all MENA countries as well as the dominant proppant type 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.

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 Gulf-based and international petrochemical producers and gas suppliers.

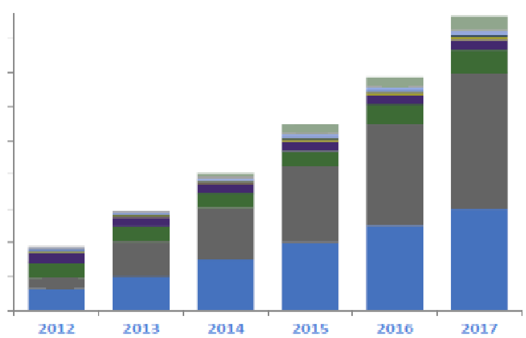


Figure 1. Oman frac capacity, by pumper (also available for Saudi Arabia, Algeria, Egypt, Libya, Tunisia, Bahrain, Kuwait, Iraq and Jordan)

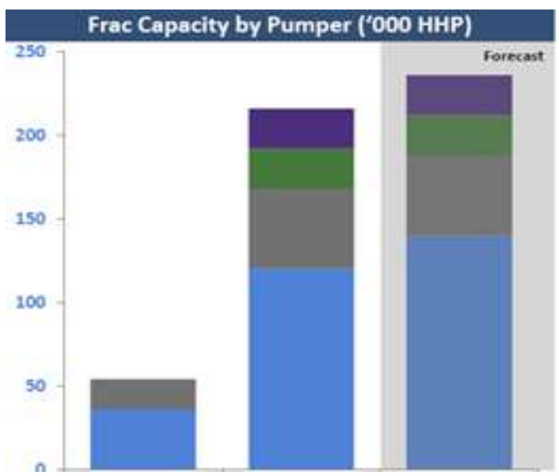


Figure 2. Forecast frac capacity, per MENA country

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

MENA Shale Study

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

- The strengths, weaknesses, threats and opportunities of unconventional gas in the MENA region.
- 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

- Jaafar Altaie spoke at the annual Middle East Petroleum and Gas Conference, Dubai from 13th April to 15th April, 2014, on the challenges for oil and gas development in Iraq
- Robin Mills spoke on the GCC and global energy and economic outlook in the Bahrain Energy Forum from 22nd April to 23rd April. The event is hosted by MEED.

Manaar Presentations

- EPC Market Study 2014
- Gas Development in Middle East: Impact on Product Demand
- Feedstock Challenges and Market Implications for Middle East Petrochemical Products

For more presentations and research, please visit www.manaarco.com

Key Manaar people

JAAFAR ALTAIE
MANAGING DIRECTOR

• Jaafar founded Manaar in 2009. He is an energy economist and petroleum business advisor to IOCs and NOCs on regional upstream business and economics issues.

ROBIN MILLS
HEAD OF CONSULTING

• Head of Consulting at Manaar Energy, Robin is an expert on energy strategy and economics, described by Foreign Policy magazine as "one of the energy world's great minds".

MOHAMMED JAMBAZ
HEAD OF KURDISTAN OFFICE, ERBIL, IRAQ

• Mohammed represents Manaar in the Kurdistan Region of Iraq from our office in Erbil. He leads our support of companies in seismic, geoscience, exploration & production, logistics, laboratory services, energy market analysis, and other sectors of the oil industry.

DR. SADIK AL JADIR
LEAD CONSULTANT

• Dr. Sadik is a Lead Consultant at Manaar with a focus on business operations consulting in Iraq and the UAE.

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Sources

Joint Organisation Data Initiative (JODI)

Energy Information Administration (EIA)

Baker Hughes

International Energy Agency (IEA)

OPEC

Wood Mackenzie

Manaar Research

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