

Oil Review

Middle East

Covering Oil, Gas and Hydrocarbon Processing

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Saudi Arabia - the push for localisation

- Moving to cleaner fuels
- The growing use of drones for aerial inspections
- New developments in reservoir monitoring
- Multiphase metering technology - the future
- Turning to technology to improve efficiency
- Oil market outlook



Ibrahim Al-Alawi, deputy CEO, AlMansoori Specialized Engineering, on coping with the challenges of the downturn
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→ Editor's note

IN THIS ISSUE we focus on Saudi Arabia's plans for the development of its oil, gas and petrochemicals sector, and Saudi Aramco's drive for localisation. The oil giant plans to double to 70 per cent the proportion of goods and services it sources from the local market by 2021, and has recently launched a major new 'In-Kingdom Total Value Add' (IKTVA) programme to promote local content development throughout the supply chain. Clearly this is the shape of things to come.

Despite the declining oil price, attendance at ADIPEC was at a high level, an indication that the Middle East continues to provide great opportunities in the oil and gas sector as operators press on with their investment plans. There was a strong focus on technologies that can help to promote efficiency and optimise costs, and a clear message of the importance of innovation and collaboration to mitigate the effects of the downturn.

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Front cover image: *vichie81 / Shutterstock*

Arabic front cover image: *iurii / Shutterstock*

Future Energy Forum to launch in 2016

BEGINNING 2016, FOUNDERS of The Iraq Club will officially launch the Future Energy Forum (FEF), an exclusive business-focused community connecting a senior network of leaders specifically engaged in the development of emerging energy markets.

FEF is spearheaded by William Wakeham and Leanne Case, both of whom are leading experts on critical business issues within emerging energy economies.

Co-founder of The Iraq Club, Iraq Business News and Libya Business News, Wakeham said that drawing on Dubai's position as the business hub for the Middle East, FEF will showcase some of the world's leading thinkers on critical business issues from geopolitics to security.

Offering members access to industry events, as well as a private online forum, FEF enables members to share experiences and best practices in overcoming barriers to doing business in emerging energy economies, in turn helping them to develop solutions to operational challenges.

"We are thrilled to be providing this much needed forum to our community, a members-only network dedicated to providing core information on best business practice in high-risk markets. Accessing the right information and connections can pose a significant barrier to doing business within these markets, thus it is in our best interest to hand pick suitable individuals to create a collective community so that knowledge is shared and new approaches are developed," he added.

Christos Charalambous, oil and gas specialist for Taylor Wessing commented, "We are delighted to be a founding partner of the FEF. Having regularly attended The Iraq Club, we have experienced the value of this network first-hand and we are happy to support its expansion into other markets."



The Iraq Club discussed the challenges of the operating environment in Iraq at its September meeting in Dubai

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→ Executives' Calendar 2016

JANUARY			
17-19	Intersec	DUBAI	www.intersecexpo.com
18-21	World Future Energy Summit	ABU DHABI	www.worldfutureenergysummit.com
FEBRUARY			
3-6	Basra Oil & Gas	BASRA	www.basraoilgas.com
14-16	ME-TECH 2016	DUBAI	www.me-tech.biz
22-24	PetroEnvironment	DAMMAM	www.petroenvironment.com
22-24	Iran Oil & Gas Post Sanctions Summit	LONDON	www.iranoilgas-summit.com
MARCH			
7-10	GEO 2016	MANAMA	www.geo2016.com
8-9	Saudi Downstream	JUBAIL	www.saudidownstream.com
20-24	SOGAT	ABU DHABI	www.sogat.org
21-23	Oil & Gas West Asia (OGWA)	MUSCAT	www.ogwaexpo.com
22-25	OTC Asia	KUALA LUMPUR	www.otcasia.org
APRIL			
10-11	Kuwait Oil & Gas	KUWAIT	www.cwckuwait.com
12-13	Tank World Expo	DUBAI	www.easyfairs.com
13-17	Iran Plastics	TEHRAN	www.iranplast.ir
19-21	8th Mediterranean Offshore Conference (MOC)	ALEXANDRIA	www.moc-egypt.com
20-23	Erbil Oil & Gas	ERBIL	www.erbiloilgas.com
24-26	Big Data Analytics for Oil & Gas	ABU DHABI	www.oilandgasbigdata.com
MAY			
2-5	Offshore Technology Conference (OTC)	HOUSTON	www.otcnet.org

Readers should verify dates and location with sponsoring organisations as this information is sometimes subject to change.

IPTC shows the way in technology use

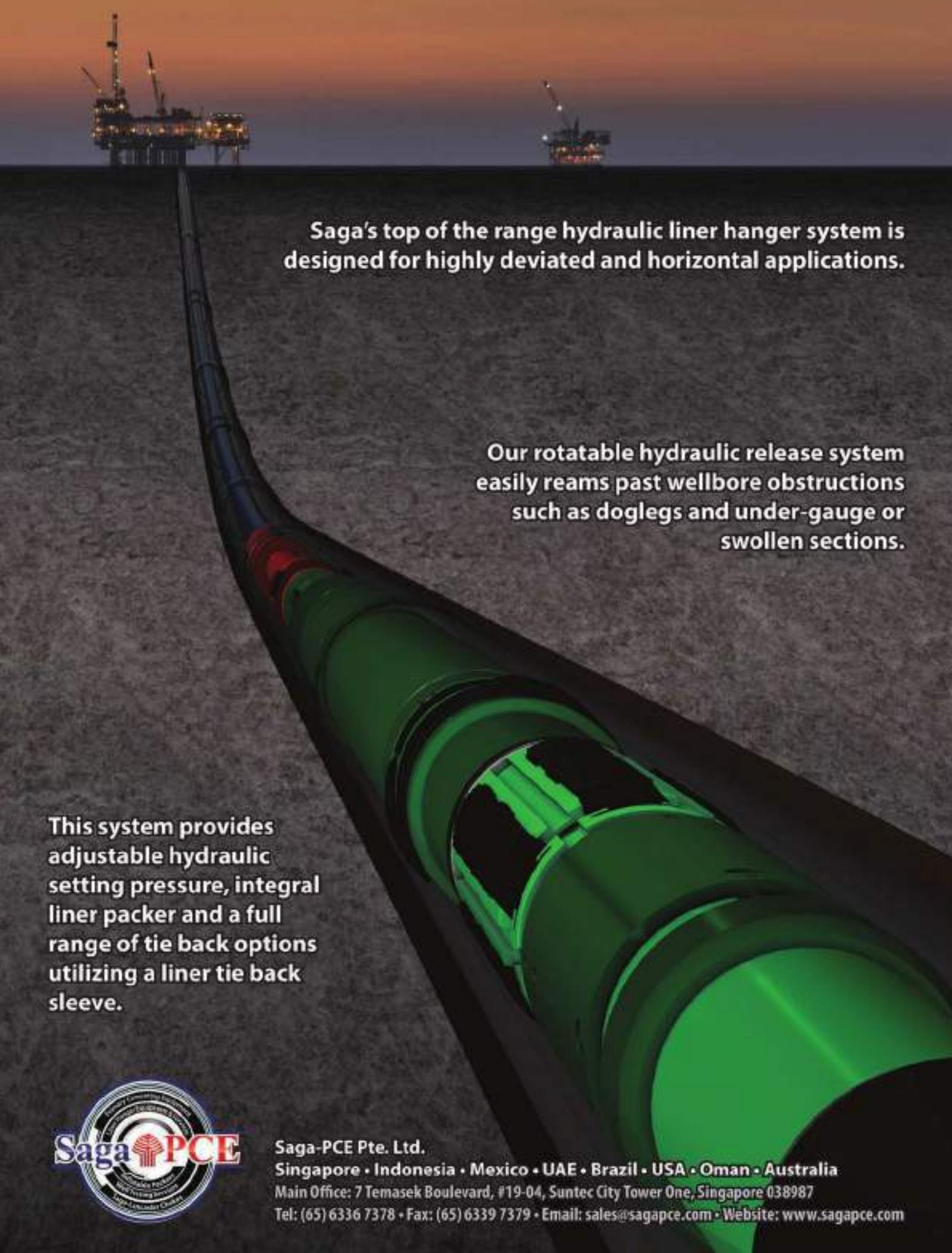
THE 9TH INTERNATIONAL Petroleum Technology Conference (IPTC) took place in Doha from 7-9 December, with the theme 'Technology and Partnerships for a Sustainable Energy Future'. Held under the patronage of His Highness Sheikh Tamim bin Hamad Al Thani, the Emir of Qatar, it was hosted by Qatar Petroleum and Shell. Professionals from around the world listened to industry leaders and world experts discuss how technology is being applied to address the most pressing industry challenges. Running alongside the comprehensive technical programme, which included over 230 papers, was an exhibition displaying leading-edge technology and innovations.

At the opening ceremony, HE Sheikh Abdulla bin Nasser bin Khalifa Al Thani, Prime Minister and Interior Minister of Qatar said, "Qatar is still on track

to optimise its natural resources to meet global demand despite the new price structure in the energy markets. Any fluctuation that is not linked to supply and demand will not be in the interests of producers or consumers in the long term".

HE Dr Mohammed bin Saleh Al-Sada, Minister of Energy and Industry of Qatar, praised the theme of this year's IPTC, adding that it was on the top priority list of any nation striving to achieve progress, saying, "The world today needs to maximise the utilisation of modern and new technologies to reduce capital and operational expenditure." He added that a billion dollar project is ongoing to recover more than 90 per cent of the gas flared at LNG loading jetties at Ras Laffan Port. Eng. Saad Sherida Al-Kaabi, president and CEO of Qatar Petroleum, said, "The petroleum industry has and will always be an international industry that

affects and is affected by all economical and political turmoil. It requires a massive and continuous investment and advancement in technology. Our projects always need longer time to start showing a real return in investment." He called upon industry leaders to convert current challenges facing the industry into opportunities for the future development of the industry. Andy Brown, upstream international director, Shell, touched on his personal experience of working in Qatar, "My own experience here in Qatar when delivering Pearl GTL was a great testament to the principles of technology and partnership." In one of two CEO plenary sessions, the CEOs of Saudi Aramco, Qatar Petroleum, Shell, Total and ConocoPhillips, discussed how investment in clean technology (such as carbon capture and storage) will mean a sustainable energy future.



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Two largest tank storage events merge

TRADE SHOW ORGANISER Easyfairs has merged Tank Storage Middle East and Tank World Expo to create a single definitive show for the Middle East and North Africa regions. Unified under one core brand - Tank World Expo 2016 - the event will take place at the Dubai World Trade Centre on 12-13 April 2016, opening its doors to suppliers and key decision-makers from across the region.

The merging of the two shows will accelerate show expansion, delivering the strongest and largest event of its kind for the tank storage industry, say the organisers. Its location in Dubai means that it is in close proximity to the region's biggest terminals, making it an easily accessible location in which to do business.

The Middle East is one of the most vibrant regions for the tank storage industry, with continued large-scale investments developing at a rapid rate and over 40mn cubic metres of independent tank storage in the region alone. Furthermore the UAE is set to double its capacity in the next few years, with Fujairah now second only to Singapore in terms of bunkering capacity.

Nick Powell, event manager of Easyfairs' Tank Storage Portfolio, said, "The purchase of Tank World Expo was extremely exciting for us as an organisation and the industry as



Fujairah is second only to Singapore in terms of bunkering capacity (Photo: Pepi / Shutterstock)

a whole. Having made the acquisition, we felt that merging the two biggest tank storage shows in the Middle East allowed us to pool the best talent, resources and innovation, to create the very best show possible. The support we have already received for the show has been phenomenal and we can already see it starting to gather momentum, particularly with the UAE Ministry of Energy already signed up as official government supporter."

This latest development closely followed

Easyfairs' acquisition of Tank Storage Magazine, and is part of the company's ongoing strategy to deepen its support of the bulk liquid storage market, reinforcing its position as the strongest and largest group of tank storage events in the world.

For more information on exhibiting, visiting or becoming a media partner, please contact Nick Powell on +44 (0)20 8843 8801 or at nick@stocexpo.com, or visit www.tankworldexpo.com.

Basra prepares to host 6th Basra Oil & Gas International Conference and Exhibition

THE SPOTLIGHT WILL be firmly focused on the 6th Basra Oil & Gas International Conference and Exhibition, Iraq's largest international oil & gas show, to be held from 3 to 6 February 2016, as the country continues to redevelop its hydrocarbon reserves.

Iraq has been the fastest-growing source of global supply growth in oil output in 2015. Its average oil production reached 3.66 mn bpd in November 2015, according to the Oil Ministry, which is the highest level in decades. Meanwhile, oil exports rose to a record average of 3.37mn bpd, up from 2.7mn bpd the previous month.

The country has the world's fifth-largest proven crude oil reserves and is the second-largest crude oil producer in OPEC. According to the US Energy Information Administration, most of Iraq's major known fields are producing or in development, though much of its known hydrocarbon resources have

not been fully exploited. All of Iraq's known oil fields are onshore and the largest fields in the south have relatively low extraction costs owing to uncomplicated geology, multiple super giant fields, fields that are typically located in relatively unpopulated areas with flat terrain, and the close proximity to coastal ports.

Iraq is re-developing its oil and natural gas reserves after years of sanctions and wars. However, despite this significant growth, the Iraqi government's ambitious oil production targets have been impacted by the huge infrastructure, economic and security challenges it faces, compounded by the global decline in oil prices.

Officially supported by Iraq's Ministry of Oil, the show will be open to domestic and international industry professionals and independent oil companies looking to invest and do business in Iraq. On hand will be state company officials and engineers, including senior-level decision makers.

The conference, which is being co-organised with the European Association of Geoscientists & Engineers (EAGE), will cover many aspects of the country's oil and gas industry, with particular emphasis on the upstream sector.

This show will provide an opportunity for delegates to hear keynote speeches from officials of state companies and ministries (Ministry of Oil and State Company for Oil Projects) as well as from senior level managers of international and local companies within the industry. They will put forward their views on ongoing developments in Iraq, including operational details, technology needs, the market outlook, and many other topics relevant to Iraq's rapidly developing oil and gas sector.

Meanwhile, the exhibition will provide a platform for companies to showcase their services, products and projects. It will provide an interactive business platform for potential customers to network with many local and international professionals offering the latest technologies, solutions and products.

Iraq has been the fastest-growing source of global supply growth in 2015 (Photo: Mike Towber)



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Oman to boost oil output despite low price



OOCEP's projected oil production for next year was 30,000 bpd to 50,000 bpd. (Photo: drpepperscott230/Pixabay)

OMAN OIL'S EXPLORATION and production division plans to invest up to US\$4bn over the next five years to boost output despite low oil prices, the state-owned company's chief operating officer has announced.

Suleiman Al-Zakwani said, "For us, low oil prices are an opportunity. We have ambitions internationally to acquire companies and enter joint ventures."

Oman Oil Company Exploration & Production (OOCEP), which runs onshore blocks, as well as the Khazzan gas plant in a joint venture with BP, has increased oil output despite a global supply glut that has

hit oil prices and revenues.

Al-Zakwani added, "We are very active in trying to grow the portfolio, there are a lot of companies out there under stress and looking for someone to bail them out."

"We plan to spend between US\$2bn to US\$4bn."

He also revealed that OOCEP was looking at opportunities in the Middle East, South Asia and Europe, and would be raising its own funds for expansion from Q1 2016.

Al-Zakwani did not give a precise timeframe for the investment drive but said it was part of an effort to reach production of 200,000 bpd in 2020.

BP buys more interest in West Nile Delta project

BP EGYPT HAS acquired 22.75 per cent in the North Alexandria Concession and 2.75 per cent in the West Mediterranean Deep Water Concession from Germany-based DEA Deutsche Erdoel AG. According to the company, both acquisitions will bring BP's working interest in both concessions of the West Nile Delta (WND) project to 82.75 per cent.

The West Nile Delta project agreement, concluded in March 2015, involves the development of 141.5bn cu/m of gas resources and 55mn barrels of condensates. Production from WND is expected to be around 34mn cu/m per day, equivalent to about 25 per cent of Egypt's current gas production. All the produced gas will be fed into the country's national gas grid and production is expected to start in 2017.

Hesham Mekawi, BP North Africa regional president, said, "We are pleased to be increasing our interest in the WND project, which is a strategic project for BP and will play a key role in helping to secure Egypt's energy supply for many years to come. This deal is another example of our commitment to help unlock Egypt's oil and gas potential through continued investments."

Iran seeks to lure back investors and ramp up exports

IRAN IS TAKING steps to ramp up oil exports in anticipation of an end to US-led sanctions in early 2016, and to improve the terms for foreign investment in its oil sector.

According to Reuters, Iran, previously OPEC's second-biggest exporter, is keen to recoup oil market share lost during USA and EU sanctions over its nuclear programme, and is aiming to boost oil output by 500,000 bpd - equal to about 50 per cent of current exports - in early 2016.

At a recent summit in Tehran, the country recently offered around 50 oil and gas projects for foreign investment, and unveiled its much-awaited Iran Petroleum Contract (IPC) aimed at luring back investors, which offers an improvement on the old buy-back model. While much of the detail remains to be clarified, the new contract is expected to be up to 25 years in duration, according to a spokesperson from energy consultancy Wood Mackenzie, to encourage foreign investors to bring in technology and knowhow. The capex ceiling is expected to be removed. "The key innovation is the remuneration fee which will float according to the oil price," said Homayoun Falashahi, Middle East Upstream analyst at Wood Mackenzie. This will allow for greater risk sharing. Further clarification of the terms is expected to be given at a conference due to take place in London in February, contingent on the removal of sanctions by then.

In another development, Tehran is extending crude contracts with its two Chinese buyers into 2016 and starting talks with other potential buyers there, sources said.

Sinopec and Zhuhai Zhenrong Corp will together lift around



*Tehran is seeking to lure back investors
Photo: Pal Teravagimov*

505,000 bpd crude from Iran in 2016, the same as this year when both took roughly half of the country's total exports.

China bought 536,500 bpd of Iranian crude oil in the 10 months to end-October, down 1.9 per cent on a year ago as a third regular client, independent Dragon Aromatics, halted purchases after a fire incident.

Iranian oil officials have, in the last two months, met with traders at PetroChina, the country's second-largest state refiner, and state-run CNOOC, which runs a petrochemical complex with Shell, sources involved in the talks said.

Iran was China's sixth-biggest crude supplier in 2015, but faces competition from rivals such as Saudi Arabia and Iraq. Iranian oil is more expensive than similar grades from other Middle Eastern suppliers due to its lower sulphur content and slightly higher yield of petrol, said a senior trader with CNOOC.

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OPEC to maintain current oil output

OPEC ANNOUNCED AT its meeting in early December that it will maintain current oil output, rather than cut production to lift sagging crude prices.

Despite oil prices plunging by more than 60 per cent in 18 months, OPEC kingpin Saudi Arabia and the cartel's other Gulf state members have defied calls to reduce output – in a year-long strategy of attempting to preserve market share and fend off competition from non-OPEC and world-leading producers Russia and the USA.

Saudi Arabia repeated the Kingdom's stance that it would be willing to cut as long as non-OPEC also reduces its output.

"We have said on more than one occasion that we are willing to co-operate with anyone that will help balance the market with us," Saudi Arabia's oil minister Ali al-Naimi told reporters gathered at OPEC headquarters in Vienna.

OPEC's secretary general Abdullah al-Badri said OPEC could not agree on any figures because it could not predict how much oil Iran would add to the market next year, as sanctions are withdrawn under a deal reached six months ago with world powers over its nuclear programme.

OPEC's 'poorer' nations – Venezuela, Ecuador and Algeria – were leading the calls for a cut to help boost prices and, in turn, their badly-hit revenues.

"Everyone is concerned about the prices, no one is happy," said Iraq's oil minister Adil Abd Al-Mahdi.

For its part, Iran has indicated that it would not take part in any cartel-wide cuts



OPEC members failed to agree on a production ceiling (Photo: Istvan)

until its own output returns to pre-sanction levels.

Markets expect OPEC, whose dozen members together pump out more than one-third of the world's oil, to leave its daily oil output ceiling at 30mn barrels, although it may increase this to reflect Indonesia's return to the cartel after a six-year absence.

According to a survey by Bloomberg, OPEC production in November 2015 rose to an above-target 32.1mn bpd.

Energy consultancy Wood Mackenzie commented, "The shift in the oil market balance we expect to occur during 2016 is still underway and not expected to change

as a result of the OPEC meeting. Total global oil supply is forecast to decline slightly in 2016 compared with a record-breaking projected increase of 2.4mn bpd for 2015 year-on-year.

"Meanwhile, it is going to be a long slog until H2 2016, with the oil market facing rising Iranian oil output and continued implied stock builds for H1 2016. One difference with H1 2015 is that US oil output is slipping into a year-on-year decline late this year and that could provide somewhat of a floor for oil prices as the market contends with the ongoing oversupply."

Expro wins Qatar contract

INTERNATIONAL OILFIELD SERVICES company Expro has won a five-year contract for the first time offshore Qatar.

The contract will see Expro provide its range of well intervention and slickline services including high deviation and heavy-duty fishing as well as in drilling and workover locations in-country.

Tarek Hekal, senior area manager - Middle East, said, "This contract is a key win for Expro in the region as we expand our presence to better serve our clients.

"In current market conditions, Expro recognises the need for operators to lower production costs. We will work closely with operators in the region to bring planning, operational and technical expertise that adds real commercial benefit to the cost of intervention."

For the financial year ending 31 March 2015, Expro's said that its presence in the Middle East and North Africa region grew, with stronger positions in all its main operating countries providing the opportunity to introduce a range of new technologies, products and services into these markets.



Expro has seen its presence grow in the Middle East



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Iran set to develop gas field with Indian companies

IRAN IS LOOKING to sign a US\$3bn contract with a consortium of Indian companies to develop the Farzan B gas field

Based on local reports, it appears that Iran could produce 28.3mn cu/m of gas from the gas field every day.

The decision to develop Farzan follows a series of developments in Iran after the prospect of the lifting of sanctions became a reality earlier this year. Specifically for the gas field, the lifting of

sanctions could mean reserves of 12.5 trillion cubic feet, with a lifetime of 30 years, could be developed profitably.

India's ONGC Videsh, which is leading the Indian consortium, had estimated that the investment would be around US\$3bn to develop the Iranian gas field. However, the company stated they have not received any communication from Iran on granting development rights.



Iran is looking to attract further foreign investment once the lifting of sanctions takes effect (Image source: TimEvanson/Flickr)

Basra Company established to boost Iraqi oilfields and gas wells

BASRA COUNCIL HAS established the Basra Company primarily to boost key sectors such as oil, gas and infrastructure. Officials from the Basra Council said they would develop under-utilised and degraded oil and gas fields.

Basra Council oil and gas committee chairman Ali Al Faris said, "We believe that the provincial government has a significant role to play in stimulating the local economy. Basra Company will be established in line with the constitution, federal laws and policies of the Iraqi government."

Holding more than 70 per cent of the country's natural gas reserves and 59 per cent of its oil, Basra is a rich investment and production hub. However, numerous oilfields and gas wells have been affected due to war. Through the new company, government officials want to create a conducive investment environment and a secure place for developers.

The government is currently in the process of awarding development contracts for the Zubair, Rumaila (north and south), West Qurna, Majnoon and Siba fields, in addition to fields in Maysan governorate. Other fields already under the supervision of the government include Al-lahis, Nahur Umr, Ratawi, Toba, Suba, and Sinbad.

Bahrain awards contract for LNG terminal

BAHRAIN'S NATIONAL OIL and Gas Authority (NOGA) has contracted a consortium of Teekay LNG Partners, South Korea's Samsung C&T and Gulf Investment Corporation (GIC) to develop an LNG terminal in the country.

The project, which will be built in Hidd Industrial area, will have a capacity of 22.6mn standard cu/m per day and will be owned and operated under a 20-year agreement starting 15 July 2018, according to a statement by NOGA.

The consortium will build a floating storage unit, an offshore jetty to receive LNG shipments, a breakwater, an adjacent re-gasification platform, subsea gas pipelines from the platform to shore, an onshore gas receiving facility and an onshore nitrogen production facility.

The project will be developed on a build, own, operate, transfer basis and will be owned and operated through a new joint venture, Bahrain LNG W.L.L. NOGA and Teekay LNG Partners will each own 30 per cent of the venture while Samsung C&T and GIC will each hold 20 per cent.

The consortium also chose South Korea's GS



The LNG terminal will be set up in the Hidd Industrial Area. (Image source: INSAGO/Shutterstock)

Engineering & Construction as the engineering, procurement and construction contractor of the project, the statement said. Teekay LNG will supply the floating storage unit vessel through a 20-year time charter.

The project will be funded using a combination of equity capital and project finance through a consortium of regional, as well as international, banks.

ADNOC and Wintershall sign MoU

THE ABU DHABI National Oil Company (ADNOC) and German E&P Company Wintershall have signed an MoU regarding future cooperation in research and development, focusing on enhanced oil recovery (EOR) using specialised chemicals for the oil and gas industry.

The main goal is to jointly develop customised solutions to meet the subsurface challenges that are characteristic for the local oil fields – high temperature and high salinity in the carbonate reservoirs of Abu Dhabi.

Following successful lab results a pilot test in Abu Dhabi is envisaged. ADNOC E&P deputy director Yasser Saeed Al Mazrouei said, "With this cEOR research project ADNOC and Wintershall will work on advanced solutions for the subsurface challenges in Abu Dhabi. If we're successful in our efforts, we might be able to enhance the recovery of local oilfields. This way we secure production and future energy supply in Abu Dhabi."

ADNOC and Wintershall seek to work on advanced solutions for subsurface challenges. (Image source: Iancu Justin/sxc.hu)



Wintershall, a 100 per cent subsidiary of chemical company BASF, is bringing its parent company's R&D capability in chemistry into the project. "Being chosen by ADNOC to cooperate in developing a new and efficient cEOR approach is a great honour for us," said Wintershall board member for E&P Martin Bachmann. "I'm convinced, together with our parent company BASF we have the right technologies to contribute something to Abu Dhabi's targets and objectives. The MoU aims to contribute to Abu Dhabi's strategic target of reaching 70 per cent ultimate recovery from its oil fields in the future."



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Iran could attract US\$70bn investments in petrochemicals

IRAN'S PETROCHEMICALS SECTOR is poised to attract investments to the tune of US\$70bn, following interest shown by European investors with the prospect of the lifting of sanctions. A report released by Wood Mackenzie has stated that Iran is inclined towards developing its petrochemical sector, with several projects in various planning and construction phases. With low cost gas-based petrochemical feedstock, Iran is a viable option, stated Afsar Hussain, an

expert in Wood Mackenzie's EMEARC Refining and Chemicals research team.

In addition, the country will also be hosting a conference to encourage investors, added Hussain. "The conference will help introduce opportunities for investment in Iran's petrochemical industry and to discuss available grounds for the attraction of FDI," said Mohammad Hassan Peivandi, deputy managing director of the National Petrochemical Company.

Petrochem industry growth looks good despite challenges, says GPCA

THE FORECAST FOR the petrochemicals industry remains positive, regardless of ongoing challenges in the oil and gas industry, stated speakers at the 10th Annual Forum organised by the Gulf Petrochemicals and Chemicals Association (GPCA).

The GPCA estimates that the GCC petrochemicals industry manufactured 136.2mn tonnes of products in 2014, earning US\$87.4bn in revenue. The region contributes 13 per cent of the global petrochemical output by volume.

Saudi Arabian General Investment Authority (SAGIA) governor and chairman Abdullahif Ahmad Al Othman said, "In Saudi Arabia, we created the master gas system to capture, treat, and process the gas through a very large and sophisticated gas network system of more than 4,000 km in length, with production capacity of nine billion standard cubic feet every day. This transformed our industry and economy to include petrochemicals."



The petrochemicals market in the Middle East is expected to grow well over the next decade. (Photo: MMMX/Shutterstock)

Over the next decade, the downstream sector is expected to play a major role in the region's economy and create 200,000 direct jobs, said Othman. The investment potential in the sector is more than US\$150bn.

With an 80 per cent share in inter-regional exports, the Middle East is considered a leader in the sector by major oil and gas companies. Global demand is expected to grow at an average of four per cent over the decade, with two-thirds of demand coming in from China and India. Aside from the Middle East, the USA is slowly emerging as a leading petrochemicals producer, added Othman. Going forward, the GPCA hopes for integration within the industry for higher growth.

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Building on technology leadership

Andrew Vaughan, Shell vice-president for Abu Dhabi and Kuwait and country chairman for Shell Abu Dhabi, spoke to *Oil Review* at ADIPEC about the oil and gas multinational's plans to develop its business in the Middle East.

What is your view on the prospects for Shell in the region, and here in the UAE in particular?

Shell has a strong project and business portfolio in the Middle East and North Africa (MENA), stretching back more than 100 years in some countries, and we continue to use our technology leadership to build an even stronger one for the future.

We have been present in Abu Dhabi since the late 1930s. Shell had a 9.5 per cent shareholding in the Abu Dhabi Company for Onshore Oil Operation (ADCO) for seven decades, and has a 15 per cent shareholding in Abu Dhabi Gas Industries Limited (GASCO). In 2013, Shell was selected as a 40 per cent shareholder in a challenging sour gas project – Bab Gas Development – in partnership with ADNOC.

In Dubai, the world's largest non-disconnectable internal turret was constructed at Dubai Dry Docks as part of the Prelude Floating Liquefied Natural Gas (FLNG) project. We also have a vibrant downstream aviation and lubricants business in Dubai, and supply Liquefied Natural Gas (LNG) to meet Dubai's rising energy needs.

To what extent is the oil price drop impacting or likely to impact Shell's operations in the Middle East?

We have to get used to a future that might be more uncertain than before and where different trends (eg. OPEC strategy, non-OPEC resilience, cost deflation, economic and oil demand growth) can play out in different ways.

OPEC has been a swing producer for decades, it is not doing that today and it is looking for market share, not simply price. The upstream industry should spend US\$500bn per annum in the period 2015-2020 to match demand, and cuts in investment amplify upside price risks.

Demand for oil, even demand growth, is expected. This year, oil demand growth is proving strong, triggered by low oil prices.

Shell is planning for low oil prices in the next several years. We do not give an oil price outlook – this is commercially sensitive.

Our 2015 capital investment is expected to be around US\$30bn, which is a 20 per cent reduction from 2014 levels. This reflects a measured pragmatic response to managing the financial framework in lower oil prices and cost opportunities in the supply chain.

“ We have to get used to a future that might be more uncertain than before and where different trends can play out in different ways”



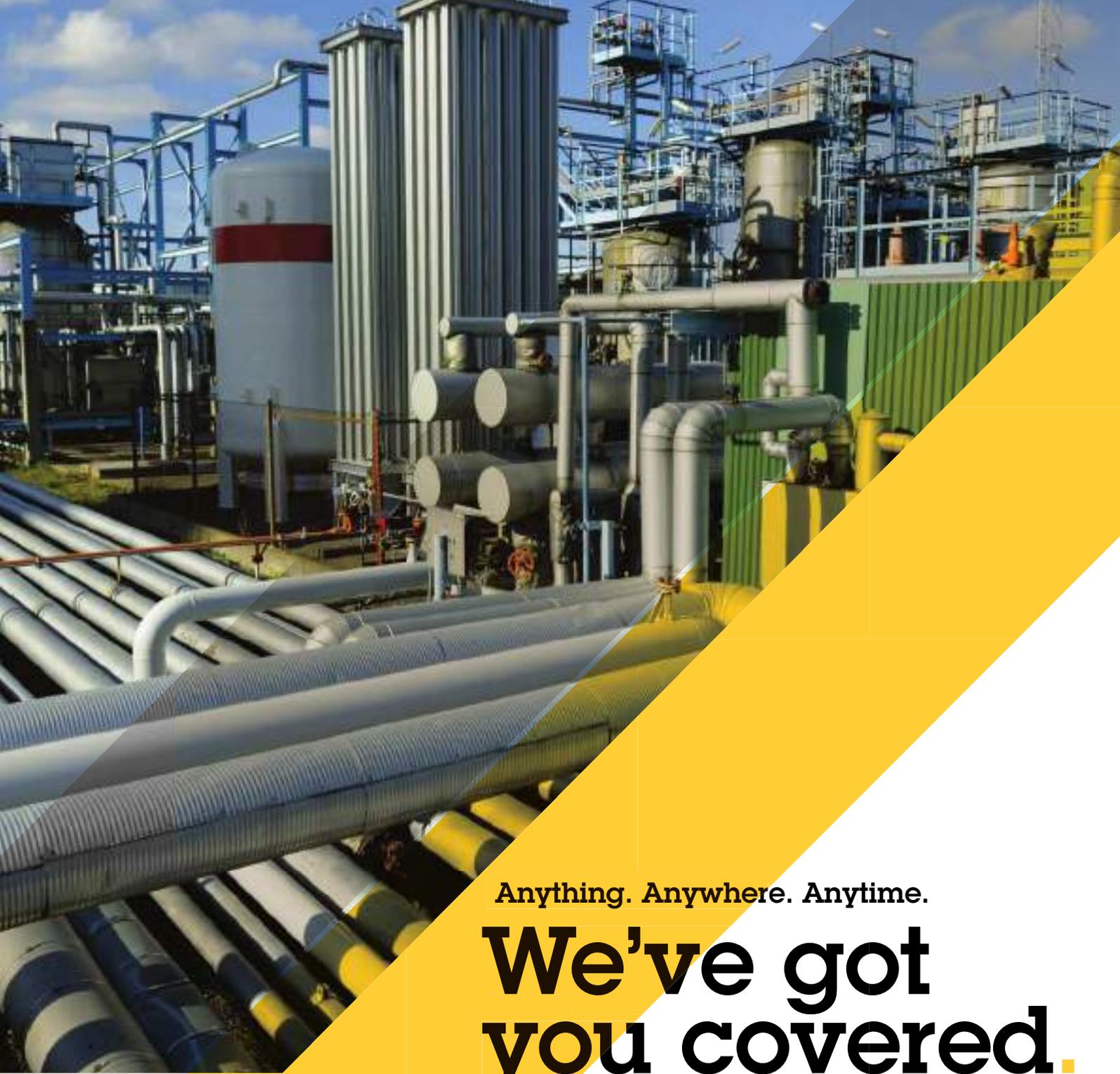
Andrew Vaughan, Shell vice-president for Abu Dhabi and Kuwait and country chairman for Shell Abu Dhabi

Shell is setting up a new integrated gas division – to what extent are you focusing on gas and gas processing in the Middle East?

Across the MENA region, it is recognised that economic growth is essential to delivering the millions of new jobs which are central to maintaining social stability.

One of the fundamentals to achieving this economic growth is a reliable energy supply, at the lowest possible cost. The energy mix will vary from country to country and many sources of energy will play a part, from hydrocarbons through to renewables such as solar. But gas can play a central role in every country. The benefits of gas in the region are clear: large reserves of both developed and undeveloped gas: gas-fired power stations take less time to build and they are cheaper, gas is also by far the cleanest fossil fuel, and capturing gas rather than flaring significantly reduces waste.

The easy, low cost gas has already been developed. There remain huge reserves of gas that are as yet untapped. This gas is more difficult to access. And, at Shell, in addition to playing a role in investment, we have the proven technology and expertise to reduce the cost of unlocking difficult gas. We have a track record of



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Shell showcased fuel-efficient cars designed and built by Higher Colleges of Technology (HCT) students at ADIPEC

delivering the complex, integrated projects that are necessary to unlock sour, tight and shale gas and develop gas in ultra-deep water.

Also, a faster solution to addressing the energy gap for countries with or without indigenous supplies of gas is LNG. Floating LNG re-gasification facilities can be developed within as little as two years. LNG is competitively priced compared to alternatives such as diesel, it offers the greatest flexibility, it enables long-term energy diversification and it is available from multiple sources, inside and outside the region.

What are the challenges in developing and sustaining a proactive or generative HSSE culture in the MENA region and how is Shell meeting those challenges?

At Shell, keeping people safe is our top priority. We aim to have zero fatalities and no incidents that harm people. We aim to make sure our operations are safe and reduce our impact on the environment and our neighbours.

Each country in the region has its own set of challenges when it comes to health, safety, security and environment (HSSE) and at Shell we do our best to provide solutions to many of those challenges specifically in our host countries and around the areas in which we operate.

For example, Shell has been involved in the UAE since 2013 in the Bab Gas Development project working with our partner, the Abu Dhabi National Oil Company (ADNOC). A specific HSSE Safety Culture programme, starting with senior leadership, is planned to embed the required HSSE culture, in particular given the high H2S driven risk profile and need for strict compliance behaviour by all staff as well as the Front End HSSE in Design focus.

The Majnoon oil field in Iraq is another example where HSSE plays a huge role in our operations and the communities surrounding them. Majnoon is built on what used to be a battlefield, and, as a result we have already cleared more than 16,000 explosive remnants of war, and our work continues. A remarkably brave team is clearing this lethal debris, allowing Majnoon to return to significant production.

The theme of ADIPEC is Innovation and Sustainability in a New Energy World; how is Shell contributing to the sustainable development of energy in the region, and are there any particular innovative practices or technologies that you would like to highlight in this regard?

Innovation and technology are at the heart of everything that Shell does and we invest more in research and development than any other international oil company to optimise production from mature fields and explore and produce oil and gas assets from new fields.

This year, the Shell stand at ADIPEC is a true representation of our long-term presence in Abu Dhabi. We are featuring our world-class technologies in integrated gas, smart mobility and WellVantage. One of the main items on our stand is our latest innovative technologies the Oculus Rift Virtual Reality Experience, through which you can see Shell's differentiating capabilities for drilling. This is demonstrated through Shell WellVantage Real Time, WellVantage Remote Operations and WellVantage Automation. Shell WellVantage Real Time connects rigs with the office-based teams and transforms real-time drilling and performance data into actionable information. WellVantage Operations take place in centres that can provide a range of services, including 24/7 monitoring, data sharing with subsurface teams and directional drilling. WellVantage Automation uses real-time data technologies and control systems to optimise drilling efficiencies. The system incorporates functionality such as closed-loop trajectory controls.

We are also showcasing our long partnership with the Higher Colleges of Technology (HCT) through the 'Made in the UAE' fuel-

“ Innovation and technology are at the heart of everything that Shell does ”



A demonstration by students who participated in the Emirates Foundation's 'Think Science' programme

efficient cars designed and built by HCT students. For the third year, HCT students have participated in the global Shell Eco-marathon competition.

Our stand also features Shell's partnership with the Emirates Foundation which started in 2005 when the foundation was first established. Since then, we have been an active partner to the successful initiatives and programmes implemented by the foundation. This year UAE students of the Emirates Foundation's Think Science Programme are showcasing their award-winning projects at the Shell stand.

“Sharing these innovations at ADIPEC is vital to the development of the industry as a whole”

This year we are also providing more interactive sessions on the Shell stand allowing the Shell experts to communicate with the exhibition visitors through panel discussions and presentations on Shell's innovative and technological solutions.

How do you hope to benefit from Shell's participation at ADIPEC, and are there any particular areas you are promoting or focusing on here?

Our main goal at ADIPEC is to exchange ideas and experience from across the globe with audiences in the region, and, in particular, to our partners in the UAE in support of the development of oil and gas assets.

ADIPEC provides Shell with an ideal platform to share and agree on solutions that support the world and the UAE's energy sectors and sustainability.

With more than US\$1bn spent annually on research and development (R&D) alone, delivering ongoing progress and innovation to support countries in meeting their energy needs alongside their resource diversification goals is atop our goals at Shell. Sharing these innovations at ADIPEC is vital to the development of the industry as a whole and the nations and their people specifically.

We value our long and successful history with the UAE and are committed to support the country in meeting its rising energy demand, and to support the Abu Dhabi Economic Vision 2030 goals, across the economic, environmental, human and social pillars. ■

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Progress is Life

Global energy trends and the move to cleaner fuels

Fatih Birol, executive director of the IEA, spoke recently on the drivers and implications of low energy prices at a press conference highlighting the findings of the IEA's latest *World Energy Outlook*.

THE WORLD ENERGY Outlook from the International Energy Agency (IEA) finds that the plunge in oil prices has set in motion the forces that lead the market to rebalance via higher demand and lower supply growth. This may take some time, as oil consumers are not reacting as quickly to changes in price as they have in the past. The central scenario is for a tightening in the oil balance leading to a price of around US\$80 by 2020, but the report also examines the conditions under which prices could stay lower for much longer.

There have been both positives and negatives as global energy prices have fallen. Consumers have benefited from lower fuel bills. Also, many governments are taking advantage of lower oil prices to cut subsidies on traditional fuels, for example, in Indonesia, Malaysia and Thailand, helping boost the competitiveness of renewable energy (renewables) sources. However, lower prices mean less investment. This is the second year of reduced investments in the upstream oil and gas sector, the first two consecutive years of declines since the 1980s. The IEA expects investment in the upstream oil and gas sector will be at least 20 per cent lower in 2015 than last year, and will continue to decline next year.

In the long term, too, low energy prices may not be desirable for consumers as well because of the implications for energy security and the transition to cleaner fuels.

Transition to cleaner fuels

There are clear signs that an energy transition towards renewables, including hydropower, wind and solar, and more efficient clean technologies is well underway. Last year, about half of new power capacity coming on stream was from renewables.

The increased political momentum behind tackling climate change is reflected in the Paris climate meeting taking place November - December 2015, with more than 150 countries, both advanced and developing, having submitted pledges to the UN of the amount and how they will reduce emissions by 2020. This is critical as the energy sector is responsible for around two-thirds of emissions causing climate change. If those pledges are implemented, global temperature should increase by 2.7 degrees celsius, which is still higher than the 2 degrees the scientists say will keep the planet as it is today. The pledges are not yet legally binding, but hope is they will be cemented. Meanwhile, clean energy technologies are being supported with the widespread implementation of mandatory regulatory efficiency standards.

“There are clear signs that an energy transition towards renewables and more efficient clean technologies is well underway”

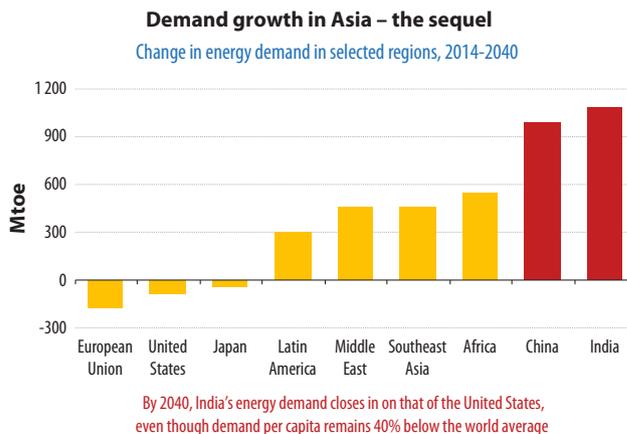
The Outlook says renewables and clean energy technologies will continue to get cheaper. As well as political momentum, economics will favour their use, particularly as more oil and gas will need to come from increasingly complex fields in the future, making them more costly.

The excessive supply in the global oil market today is due mainly to the growth of US shale oil over the past five years, from which about half the growth in supply comes from. If the oil price remains at around US\$50 between now and 2020, US light tight oil (commercial oil) will decline by about 2.5mn bpd compared with levels today. If the price is US\$40 for the next five years, it will decline by about 3mn bpd – a significant amount. For US shale to be profitable, prices need to be between US\$60 and US\$70 a barrel. Of course, the USA is not the entire picture – other major producing countries like Canada and Russia have been impacted too.

Demand growth

Over the next 25 years, the IEA expects global energy demand to grow by around one third, which is considerable. This will come from Asia, Africa and the Middle East, with demand from the USA, Europe and Japan declining significantly despite their economies still growing. As a result, the links between global economic growth, energy demand and energy-related emissions weaken. Meanwhile, as demand grows and the market rebalances, the IEA expects oil prices will gradually recover to around US\$80 by 2020.

The report also examines what it takes for a US\$50 oil price to become the new norm for 10 or more years. First, US shale oil producers and other suppliers need to be much more resilient in terms of price. At \$50 they are losing a lot of ground. Second, there is a need for a stable Middle East, with a boost to supply from Iraq and other countries there.



Source: IEA World Energy Outlook 2015



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In a US\$50 world, oil importers would enjoy economic benefits and ongoing subsidies. But the IEA believes this is not good news for consumers in the long run. Recently, oil production has come from more diverse sources, many of which are high-cost producers in North America, Latin America and Africa. In a US\$50 world, their production would be much lower, and supply would become concentrated in a very few low-cost countries in the Middle East. Today, about 50 per cent of global oil exports come from the Middle East; in a US\$50 world this would jump to 75 per cent. However, the Middle East's significant geopolitical issues are unlikely to be resolved any time soon; therefore, relying on a very small number of countries in a region in turmoil may not be the best news for energy security.

Another implication of a US\$50 world is there would be less incentive for improving energy efficiency. The IEA's analysis shows that at least 15 per cent of efficiency savings would be lost. Also, political support for renewables may be more difficult to legitimise in a long-term low energy price environment.

However, the IEA believes a US\$50 world for 10 years or so is unlikely, as low prices would lead to a huge reduction in the revenues of the low-cost producers and, as oil becomes cheaper, demand would increase.

New energy mix

Asia is the heart of the natural gas trade. Today, there is about 400bcm of demand coming from China and India, but the IEA expects this demand to grow strongly, and although there are plentiful amounts of gas in Asia, there will need to be substantial gas imports. Everyone in the gas industry is focused on this requirement

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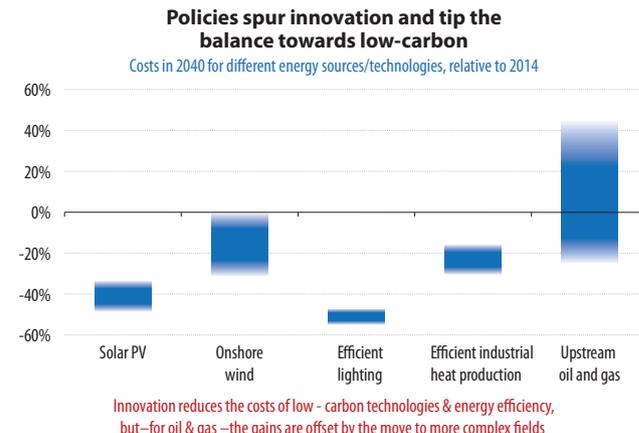


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Source: IEA World Energy Outlook 2015

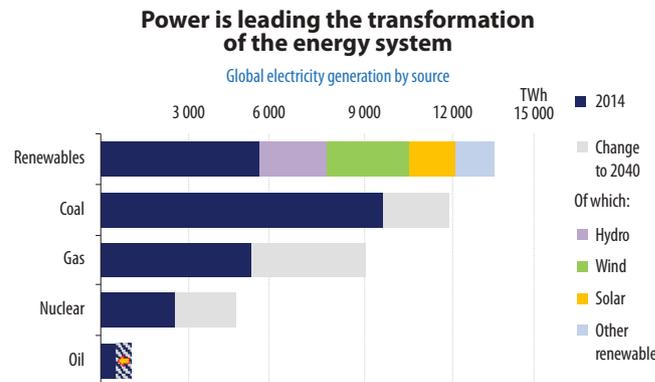
and on which exporters are going to get what and under what conditions.

The report highlights how gas is facing strong competition from coal and renewables. Coal is still much cheaper than gas in Asia, and, in the absence of any regulations, preference is for coal-fired over gas-fired power plants as they are much cheaper to build. Solar and wind are becoming increasingly competitive and, in many cases, have government support.

“

Over the next 25 years the IEA expects global energy demand to grow by around one third”

In the past few years, China has become a major coal importer. However, we are approaching the end of the single largest demand growth story in energy's history. The era of China's boom in terms of energy demand growth is coming to an end. Even though the economy will continue to grow, energy demand will grow much more slowly, as China moves from being a heavy industry-based to a service-based economy.

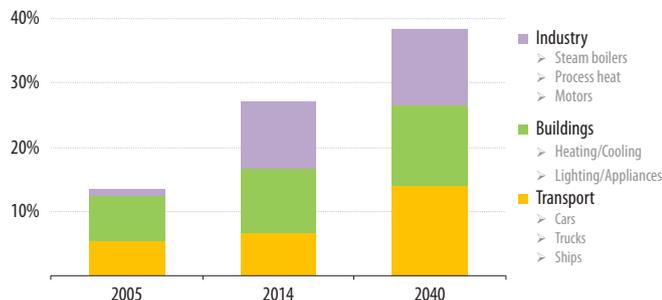


Source: IEA World Energy Outlook 2015

Furthermore, China's energy mix is becoming more diverse. China has the strongest energy efficiency push and is the champion of renewables. Coal and oil are losing market share, while gas and nuclear are growing very rapidly. Today, almost 40

Efficiency measures on the rise, but significant potential still exists

Share of global mandatory efficiency regulation of final energy consumption



Energy efficiency policies are introduced in more countries and sectors; they continue to slow demand growth but more can be done

Source: IEA World Energy Outlook 2015

per cent of all nuclear plants under construction are in China. Given the sheer size of the Chinese market, this will have a very big impact on energy markets everywhere.

Meanwhile, India takes over from China in 2040 as the largest source of consumption growth for every major element of the energy mix – oil, gas, coal, renewables and nuclear – due to its strong economic growth, large (and growing) population and low (but increasing) levels of energy use per capital. As a result, the choices India makes will be important for everyone, and India's push for clean and efficient technologies needs to be supported, says the IEA.

“Renewables are set to become the leading source of new energy supply from now to 2040”

Across the world, renewables are set to become the leading source of new energy supply from now to 2040 and the biggest area for investments, with their share in total primary energy demand forecast to rise from 14 per cent in 2014 to 19 per cent in 2040. Renewables contributed almost half of the world's new power generation capacity in 2014. Out of every US dollar invested in the power sector, 60 cent is in renewables, says the IEA. In other words, renewables is no longer a niche fuel, but has become mainstream. In the past, hydropower led this growth, but, in the future, the IEA expects the biggest increase will come from wind, followed by solar. Two-thirds of growth in renewables is coming from emerging countries, not from OECD countries.

Efficiency moves

All countries are expected to adopt more energy efficient technologies. The report looks at how much energy consumption worldwide is covered by energy efficiency policies. This has increased to close to 30 per cent from 15 per cent in 2005, and is expected to continue to rise in future. These are mandatory regulations for such everyday items as refrigerators, cars and laptops. Today, around 70 per cent of all cars worldwide are subject to mandatory fuel efficiency standards – in 2005 it was less than 50 per cent.

Oil companies, therefore, should take note as demand, being a key part of the oil market, will be hugely affected by these efficiency standards. ■

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Gaining an advantage by maintaining spending

As capex budgets are slashed globally, maintaining spending and capitalising on plunging project costs could enhance Gulf producers' future position, says Samuel Cizuk.

MENA OIL PRODUCTION continues at high levels, fuelling a continued stock-build as non-OPEC production remains resilient despite low prices. Global supply outstripped global demand by around 1.6mn bpd in October, according to the IEA. That means that demand is starting to catch up with supply, as stock builds came in at around 2.5mn bpd at the start of the year. Nevertheless, we will likely be well into 2016 before we start seeing a balanced market.

Non-OPEC production has proven resilient in the face of the weak oil price. US shale oil production has been in decline for a few months now, but conventional production from established plays, as well as Canada's oil sands projects, do not, in

general, show much of a price-driven reaction. No wonder then, that the message from many companies, banks and traders has switched to the "lower for longer" mantra.

For the Gulf producers, as for all other producers, finding a silver lining to this scenario is difficult. Iraq, Kuwait, the UAE and Oman are all at some stage of

executing growth plans. In Oman much of the work done has been targeting EOR at mature and declining assets, but a few green field projects have been implemented in the hope of lifting the country's liquids and gas production capacity in the coming two to three years. Kuwait and the UAE have the geological opportunity to be more ambitious regarding their growth programmes, and consequentially now have to decide whether to continue lifting production capacity to 3 and 3.5mn bpd respectively, or whether to join the global capex rout.

“ Non-OPEC production has proven resilient in the face of the weak oil price”

Ambitious expansion programme

Iraq is in the middle of a very ambitious capacity expansion programme, at one time

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officially envisaged to reach 12mn bpd from a post 2003-war dearth of around 2.4mn bpd in 2008. More realistic assumptions have put the achievable output goal at around 5 to 6mn bpd, and in a much longer timeframe than 2020. Due to the service contract framework implemented by Iraq for the involvement of IOCs and foreign NOCs in the redevelopment of its oil industry, project cost reimbursements have rocketed at a time when the oil price has plummeted, leaving the country no option but to repeatedly ask companies to scale back on their work and their targets. Further investment is required, although the country lacks a working and attractive framework outside the autonomous Kurdistan Region of Iraq.

Meanwhile, Qatar might have joined Bahrain as a decline producer on the crude side, with little upside having been discovered in recent rounds of offshore oil exploration. Decline rates at mature projects have also emerged as quite significant. A signpost for the evaluation of the Qatari crude production future will be the retendering of the offshore al-Shaheen field as Maersk Oil's license expires in 2017, and what new production targets might emanate from that process.

Saudi Arabia's plans are currently focused on maintaining the existing 12.5mn bpd production capacity and trying to lift natural gas output.

Iran, which after years of sanctions has limited financial resources and is in dire need of expensive foreign technology, particularly in the reservoir management field, is set on regaining as much of a market share it can when sanctions are lifted. The country saw roughly 1mn bpd of oil exports shut out of the market in 2012. Late October witnessed the so-called "Adoption Day" of the nuclear agreement, the first goal post, without any of the sides having reneged due to domestic political pressure. Adoption Day is to be followed by "Implementation Day", sometime in the new year when Iran starts to deliver on its part of the bargain, after which sanction waivers start being applied. Official plans for 0.8-1mn bpd of additional production are judged by most observers as vastly exaggerated, however even the addition of 200,000-300,000 bpd of exports in a relatively short period of time towards the end of Q1 2016 could exert a significant drag on the oil price.

Iran is hoping to attract much needed foreign investment with the help of a new and more favourable contract framework, further details of which are expected to be revealed in London in February.

Throughout the region, committed investments weigh heavily on government budgets, as even where IOCs are involved, state champions play significant roles.

Renewable initiatives could benefit significantly from the lifting of fuel subsidies (Photo: Masdar)



Cost deflation

Joining the world's IOCs in cutting capex is probably looking quite tempting to several of these countries' leaderships – where this is not already being done. However, there are strong reasons to behave counter-cyclically. With the oil price plunge, project costs have come crashing down. Service companies are emerging from a long stint of high prices with considerable overcapacity, which leaves them with little option other than to try to save whatever market share they can by competing on price. The result has been a formidable project cost deflation in the past 6-9 months – a process which appears to have not yet run its entire course.

“Taking advantage of the favourable costs at this time could represent a more far-sighted strategy”

Global demand continues to rise, and perhaps the main story of note in the oil industry during 2015 has not been the renewed price weakness by mid-year, but the formidable demand reaction to low prices. Average demand growth has been 1.8mn so far in 2015, according to the IEA's January-October data. While the organisation forecasts a slowed growth rate during 2016, there is also an opportunity for the Gulf countries to manage their demand counter-

cyclically.

There have been many reports written advocating the slashing of fuel and electricity subsidies, making the case that even though they weigh much lighter on government budgets in times of low hydrocarbon prices, lifting them now also has less of a negative economic impact on the population. This would be a good time for Gulf states to continue spending on their nascent renewable energy developments. Project cost deflation could help to make the projects look more viable, while reducing some of the future domestic oil and gas demand growth and keeping it from eating into the Gulf states' export capacities in a few years' time, when markets again start to tighten. In the case of Oman for example, every cubic foot of additional gas freed up from domestic demand could feed the country's two under-utilised LNG export ventures. Saudi Arabia too, however, has much to gain here, as its drive to raise gas production to meet electricity demand and stop direct burning of crude to meet summer peak demand for power every year, has not been sufficiently successful.

Taking advantage of the favourable costs at this time could represent a more far-sighted strategy, despite the currently depressed project economics for both renewable and hydrocarbon projects. Renewable initiatives would at least benefit significantly from domestic fuel and power subsidies being lifted, creating a movement towards market-based electricity and fuel pricing in this region. ■



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Satellite technologies - eyes in the sky

The latest generation of satellites has significantly increased potential applications for the oil and gas industry, as Michael Hall, senior geologist at Airbus Defence and Space, explains.

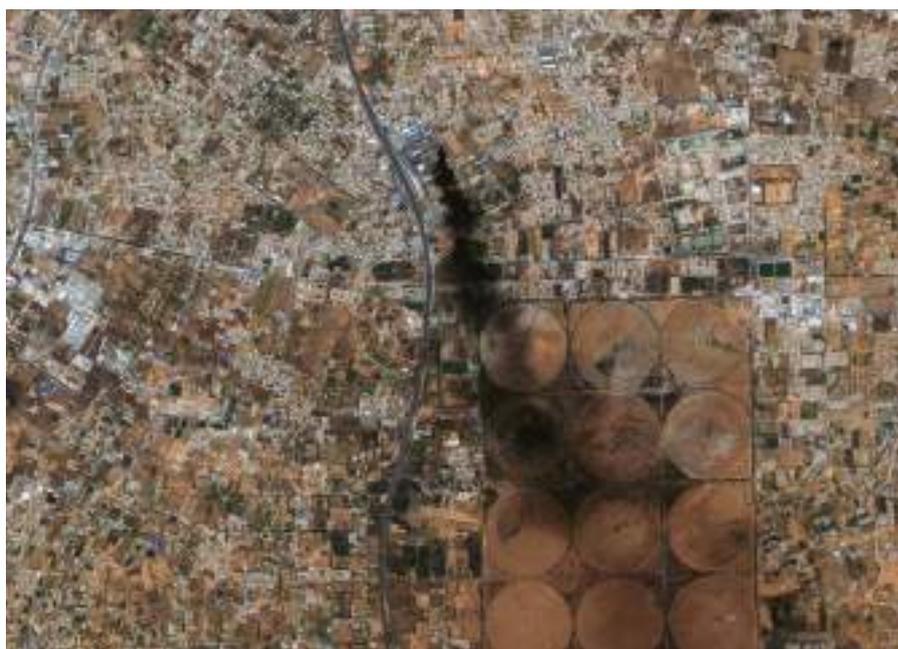
IN THE UNPREDICTABLE and often challenging times we live in today, maximising workforce safety and securing physical assets represent priorities for all those involved in oil and gas extraction. From the earliest stages of exploration planning through to the final days of decommissioning, having accurate, timely information is vital.

Throughout the lifecycle of an oil and gas project, production facilities will require ongoing monitoring. However, the type of monitoring needed varies greatly at times and in locations with different challenges. For example, in an area suddenly witnessing increased seismic activity, change detection monitoring and analysis will provide crucial data on the environment surrounding a facility. In this scenario, change detection related to geospatial intelligence requires temporal dense and reliable information regarding historic and ongoing activities in order to detect and interpret the smallest of changes.

Compare this to a facility that is under attack by a malicious faction. In this instance, the role of satellite imagery providers is to deliver near real-time visibility of the situation on the ground without sending people onsite. Image resolution, revisit capabilities together with speed of processing and delivery understandably become the most important factors operators need to consider.

Clearly, oil and gas operators require specific, highly interpreted and cost-effective information relating to operational or environmental changes in order to organise an effective response to any potential issue. That is precisely where satellite operators and their partners are able to excel.

“Over the past two decades, satellite technology has come a long way”



Pléiades satellite image - Tripoli, Libya (Copyright: © Airbus Defence and Space 2015)

Remote monitoring

Over the past two decades, satellite technology has come a long way. These improvements are due to a small number of providers constantly investing in new satellites, which utilise the latest technology, resulting in improved resolution, greater programming responsiveness and the ability to acquire more images in a given period. Commercial image resolution, long considered the benchmark for satellite remote sensing, was once limited, but has now increased. There has also been a dramatic reduction in the time between the raw image being captured by the satellite and the processed image being delivered to a client. Processing could take hours or even days in the 1990s, whereas the same raw image can be processed in minutes today.

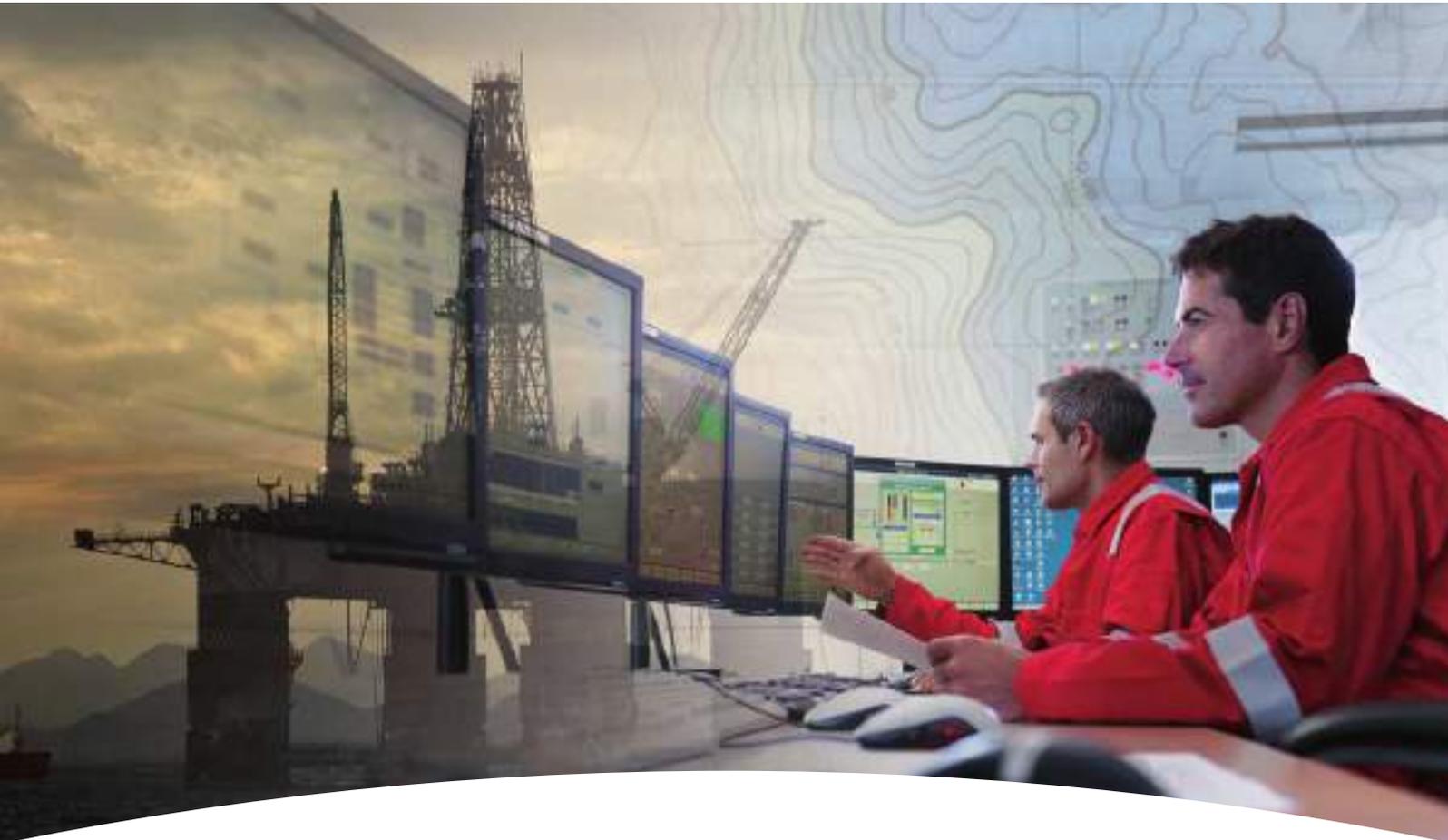
The range of applications is also increasing. Today, for example, satellite imagery, which delves below the surface of

the ocean offering sight up to around 30m, is readily available, and is a valuable tool for the assessment of water depth and mapping of habitats prior to the development of new offshore assets.

The size of a satellite provider's archives is also an important aspect of monitoring. Many earth observation satellite companies have years of imagery on file. Airbus Defence and Space's archive data stretches back three decades – having access to such a wealth of information allows analysts to compare and contrast current environments with those of the past, illustrating how man-made or natural changes have affected an area of interest.

Before instigating exploration activity in an area, such as starting a seismic acquisition campaign or drilling activity, it's useful to have reliable baseline data relating to any previous activity in the area, or knowledge of any existing pollution. For

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most interpretation projects, archive imagery a few months old will offer a sufficient and cost-effective tool for mapping roads, infrastructure, land-cover and for generating digital elevation models to assist with environmental and planning applications.

Instant crisis response

The latest satellite technology allows customers to rapidly capture images of an emergency situation in any location around the globe. This fast reaction capability allows companies to assess the situation and initiate critical emergency action plans when people, assets or the environment are at risk.

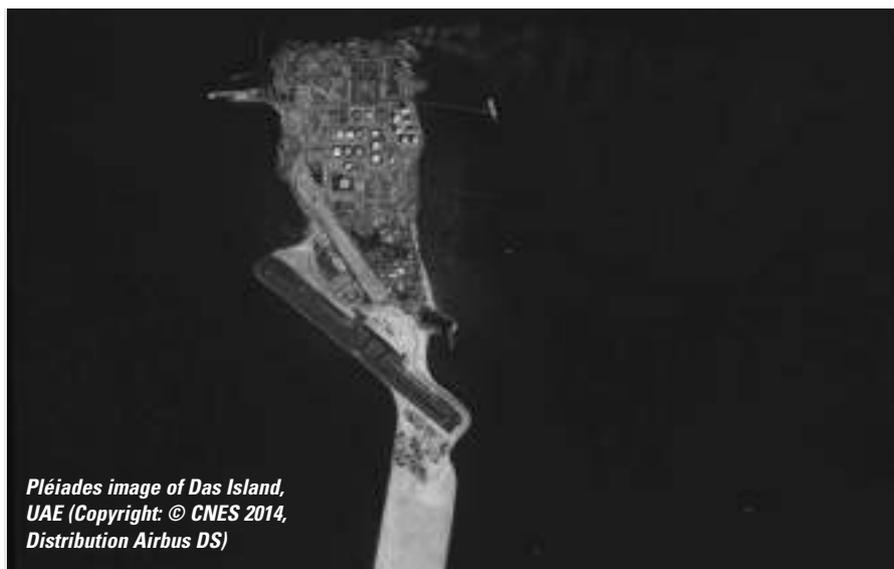
Common security concerns vary from terrorist attacks to the illegal tapping of pipelines, and since oil and gas operations are increasingly operating in areas with these security concerns, geospatial information provides a unique tool to contribute to asset monitoring. For example, when fighting by militia groups in and around Tripoli resulted in oil storage tanks being hit, the resulting fire caused the facility to burn out of control. A fast response was therefore needed to gain visibility of the situation on the ground. Airbus Defence and Space's Pléiades satellite was tasked to provide high-resolution imagery of the affected area, and once the satellite acquired the required imagery, the processed high-resolution, near real-time images were available for download in just 90 minutes after acquisition.

In another example, a request was received to obtain satellite images of 11 different natural gas pumping stations strung out along the Transco pipeline between eastern Pennsylvania and New Jersey on the USA's east coast. Eleven point targets were submitted on a Friday and 10 of the 11 areas were collected and validated on the following Monday morning – highlighting the speed with which data can be gathered and presented to client companies in a usable form in order to make intelligence-led decisions.

Reducing footprint, cutting costs

To provide greater levels of intelligence, satellite operators have combined emergency response satellite services with access to experts who specialise in image ordering, interpretation and analysis.

“Common security concerns vary from terrorist attacks to the illegal tapping of pipelines”



Pléiades image of Das Island, UAE (Copyright: © CNES 2014, Distribution Airbus DS)

Offshore oil spills, for example, can impact coastlines and fragile marine ecosystems, as well as cause significant reputational damage. Oil spills from offshore platforms, support vessels or ruptured pipelines can be difficult to track using traditional means, particularly those affected by poor weather conditions. The severity and impact of a spill can be minimised if identified early, therefore, long-term routine monitoring from satellites, where imagery are acquired at set intervals, can help to quickly identify potential risk factors, the presence of a spill and provide data on sea conditions, as well as the possible source of the leak.

In the offshore environment, oil slicks are most commonly spotted using Synthetic Aperture Radar imagery, which recognises slicks by analysing the dampening effect oil has on the water's surface. Satellite radar data has various imaging modes suitable for monitoring across wide swaths of land or sea and is independent from weather conditions, significantly reducing the response time for gaining information in cases where events occur during night or under cloudy conditions.

Automated change detection

Although very high resolution imagery is vital for detailed assessment of the earth's surface, the disadvantage can be the limited size of the area that can be captured by the satellite as it passes over an area of interest. To address this, satellites such as the SPOT 6 and 7, have the capability to acquire imagery at high resolution, but also over large areas, which are often key assets when dealing with detection of change related to oil and gas exploration and production. Each of these satellites has the capacity to acquire imagery covering up to 3mn km² per day, offering an imaging swath of 60 km at a resolution of 1.5m.

With the ability to highlight and classify change accurately and on a regular basis, semi-automated change detection techniques assist with updating existing

maps, but also can be a basis for reliable alerts on land-cover, well pad and other infrastructure changes and to monitor facilities more generally over time. This approach speeds up the analysis process, reducing the need to spend time and resources interpreting imagery and other data. Satellite tasking teams can provide support for each tasking request, proposing tasking plans, validating acquisitions and providing regular updates. Within hours of being acquired, images are processed and algorithms can be instigated to evaluate the imagery allowing detailed interpretation to be focused on those areas identified as experiencing the most significant change.

Monitoring surface changes

Exploration and drilling in areas prone to surface movement requires careful monitoring. A number of natural and man-made events can alter surface morphology and impact infrastructure. Whether the region is susceptible to volcanic or earthquake activity, or suffers from subsidence caused by oil and gas extraction, the distribution and magnitude of movement needs to be identified. Roads may crack and pipelines and power cables damaged. By using space-based monitoring and employing interferometric techniques based on radar such as Airbus Defence and Space's TerraSAR-X satellite, change can be detected and quantified down to just a few millimetres, allowing appropriate mitigation measures to be put in place.

Overall, having regular access to timely, accurate data provides analysts with a regular stream of actionable information when managing facilities impacted by any number of man-made or natural events. Advances in satellite technology, in terms of image resolution, accuracy and agility, combined with innovative approaches to processing and analysis, are contributing to earth observation techniques, making an increasingly valuable contribution to the oil and gas sector – reducing costs and improving safety. ■

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The leading trade fair for security, safety and fire protection, Intersec 2016, will take place between 17-19 January at the Dubai International Convention and Exhibition Centre, with an expected 1,300 exhibitors.



More than 27,000 visitors attended Intersec 2015 at the Dubai International Convention and Exhibition Centre. (Photo: Messe Frankfurt)

ORGANISERS ARE LOOKING forward to the show, following a successful show last year that hosted more than 27,000 visitors and 1,200 exhibitors. A comprehensive range of products across five broad sections – commercial security, information security, fire and rescue, safety and health and homeland security, and policing – will be showcased.

Sectors such as aviation, construction, hospitality, healthcare, oil and gas, banking, telecommunication, ports and smart cities are expected to benefit from the show, said the organisers.

A value-add at this year's show are new features that will be introduced for the first time such as smart home automation, safety design in buildings, perimeter and physical security, and homeland security.

Smart home automation: The Middle East

smart home automation market is pegged at approximately US\$55.8bn by 2020, paving the way for companies such as Schneider, PELCO, Fermax, Assa ABLOY, Honeywell, Xtralis and CP Plus to showcase their latest innovations at Intersec 2016.

Safety design in buildings: Solutions related to life safety design, building construction, fire protection, fire-rated building materials, fire alarm systems and smoke ventilation systems will be part of this section.

Perimeter and physical security: Increasing threats to our homes and offices, in addition to the advent of new technology have led to a booming market for perimeter and physical security. At Intersec 2016, visitors can expect to see companies such as Kabat, Optex, Fiber Sensys, FAAC, Assa Abloy, CAME, TISO, Gunnebo, Automatic Systems, Pilomat, Southwest Microwave, FLIR

Systems, Sorhea and Stanley emphasising the need for heightened perimeter security measures.

Homeland security: The threats are not just confined to our homes; the nation is at risk too. Along with the General Police Equipment Exhibition and Conference (GPEC), Intersec will host the GPEC Pavilion that will highlight a range of technologies that are used by police forces, border guards, immigration officers, prison services, special task forces, government intelligence and security services.

The industry feedback has been positive, with some saying attending Intersec is “a must” for them and others having made profits at the show and reporting a marked increase in business. In 2016, too, organisers are hopeful for a strong show of support, quality exhibitors and potential for good business. ■

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Oil companies across the Gulf are looking for highly skilled foreign workers, especially at managerial level. (Photo: carlosseller/Shutterstock)

Working in the Middle East

At a time of low oil prices and mothballed projects, the Middle East remains an attractive prospect for experienced oil and gas professionals looking for their next contract, as Petroplan's Jon France discusses.

THE NUMBERS TELL their own story: OPEC reports that in 2014 the Middle East accounted for around 23.51mn barrels of oil equivalent per day – or 30 per cent of global production. Although 2014 saw the rig count across the

Middle East go down by 30, there were still 505 active in total, including 145 in Saudi Arabia and 135 in Iran.

In fact, today the Middle East is a centre for some of the world's biggest, most exciting energy projects. Oil and gas developments worth about US\$700bn are either planned or underway in the UAE, for example. Abu Dhabi is investing an additional US\$25bn in its oil industry over the next five years, while Kuwait has committed to development projects worth at least US\$12bn.

As a result, oil companies across the Gulf are looking for highly skilled foreign workers, especially at managerial level. On the surface then, this looks like a marriage made in heaven: plenty of talent is available at a

time when a number of extremely successful companies are looking to hire them. Add in a reputation for extreme wealth and low taxes, and the Middle East is suddenly a very appealing destination for workers migrating from more mature markets such as Calgary, Houston or Aberdeen.

However, professionals looking to move to the Middle East are often surprised to find that financial remuneration in the region isn't as high as it is in Europe or North America. The total package will include travel and accommodation, and it will be tax-free, but even managers applying for a permanent position may find that the base salary on offer can be less than they have earned elsewhere.

“ Saudi Arabia also tends to be in a slightly higher salary bracket to compensate for the cultural and social restrictions in place.

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Strict grading systems

Remuneration packages are allocated according to strict grading systems and salary scales – and, in contrast to European and US firms, there is no deviation from these, even for the very best candidates.

That said, there is still a lot of positive news for these candidates. It's always a mistake to generalise, and salary arrangements in the region are no exception. Certain roles, for example, can still command the highest salary levels. Engineers, for instance, often find that they can earn a salary that is broadly in line with what is on offer in other parts of the world. On the other hand, when it comes to disciplines such as drilling and sub-surface – where good managerial candidates or drilling experts are traditionally more expensive – the salary on offer is perceived to be less than expected.

Equally, there are variations by country. Companies in stable places like Abu Dhabi or Dubai tend not to pay as much as the companies in Iraq and Kurdistan Region of Iraq. Saudi Arabia also tends to be in a slightly higher salary bracket to compensate for the cultural and social restrictions in place.

These differences are often reinforced by the nature of the contracts on offer. Expats in Iraq, Azerbaijan and Kazakhstan are often on a four-four rotation, frequently on a contract basis. Salary and risk money is pretty much the only compensation available – and so tends to be higher.

In Saudi Arabia and the UAE, contracts are frequently offered on a permanent and residential basis. Employers prefer to have someone who's committing to the company for many years. This means that companies in these countries can compensate for lower pay rates with a broader package that takes family requirements into account.

This is an important part of the work experience in the Middle East. It's a way of



Working in the Middle East can be incredibly attractive because of high residential standards and tight security. Also the tax-free salary comes with plenty of facilities to support family life and social activities. (Photo: Elnur/Shutterstock)

life that, for the right person, can be incredibly attractive. Residential standards are high, the weather is good, and security is tight. The tax-free salary comes with plenty of facilities to support family life and social activities.

Competition for candidates

Across the region, firms recognise that they are in competition with each other for the best candidates. Many are attempting to upstage each other with facilities for expats. Some firms, for example, are building massive complexes with sports facilities, swimming pools and shopping centres – all for the valuable expat community.

Equally, there is a sense of security and longevity when it comes to taking on roles in these countries. This is the antithesis of the short-termism that can be found elsewhere, where the end of a contract is always a looming concern. It can be a

powerful incentive for professionals looking to build up long-term financial security for themselves and their families. The size, scale and nature of the projects mean that working in the Middle East offers very good CV points. It helps that the health, safety and environmental standards in place are now comparable with those found anywhere else in the world.

It is generally recognised by the majors in the region that their position on salary can restrict their choice of candidate. They are, therefore, working hard to compensate in every other area. For professionals looking for the next step in their career, for certainty and security, or for a different way of life, a move to the Middle East has plenty to recommend it. But a realistic approach is essential. Salaries are not what people expect. The advantages of the Middle East are more nuanced than that. ■

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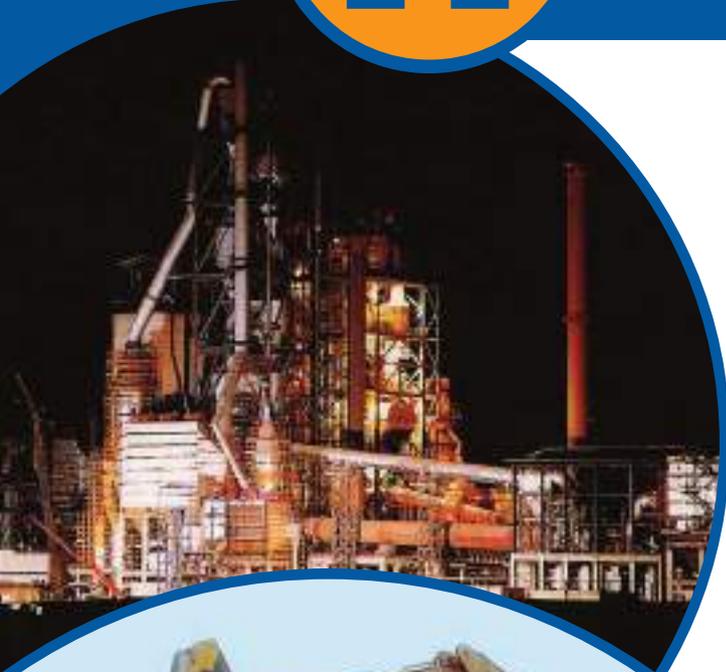
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Plotting a path for petrochemicals

Saudi Arabia is by far the region's largest producer of petrochemical products, but, as the oil price continues to sit at below US\$50 a barrel, and with the fall in demand from its biggest customer China, the Kingdom's producers have much to consider over the coming months. Economist Moin Siddiqi investigates.

AFTER ASIA, THE GCC is the second-largest growth region in the world for the petrochemicals industry, with a total capacity of 149mn tons of products in 2014, up from 127.8mn tons in 2012, according to the Gulf Petrochemical and Chemical Association (GPCA).

Saudi Arabia maintains its leading position as the region's number one petrochemical producer, with two-thirds of the GCC's installed capacity. The sector has helped to diversify the regional economy over the past three decades, thereby reducing heavy reliance on crude oil exports.

With revenues of US\$88bn in 2014, the petrochemicals industry contributed to one-third of the Gulf's total manufacturing gross domestic product (GDP) and employed some 150,000 people, as well as attracting sizeable private investments.

Abdulwahab Al-Sadoun, secretary-general of the GPCA, explains, "Petrochemicals is evolving into an industry that touches nearly every sector of the GCC economy – from supply chain, equipment

manufacturing, construction and agriculture, to the retail and trade sectors."

The Gulf remains the world's lowest-cost region for petrochemicals output. GCC manufacturers account for about one-fifth of global output of ethylene glycol, and of total linear low-density polyethylene (18 per cent); high-density polyethylene (17 per cent); ethylene (14 per cent); polypropylene (13 per cent); and methanol production (11 per cent). The region currently exports around four-fifths of its products to more than 80 countries, amounting to 66.1mn tons.

The region's leader

State-owned Saudi Basic Industries Corporation (SABIC) has developed a world-scale petrochemicals industry – constituting more than 10 per cent of global production and is now the largest supplier of ethylene, ethylene derivatives and methanol. Three factors underpin Saudi Arabia's petrochemicals sector. First of all, it holds the world's largest conventional oil reserves (267bn barrels), plus substantial proven natural gas reserves of 288.4 trillion cubic feet (Tcf) and an estimated 600 Tcf of unconventional shale gas. Secondly, the availability of cheap energy feedstock costs at US\$0.75 per million British thermal units (BTU), gives an unbeatable comparative edge to Saudi producers. Finally, it has a strong industrial and regulatory infrastructure, which has been integrated into specially-developed industrial cities, namely Jubail and Yanbu.

“ Saudi Arabia has an edge over its peers regarding product quality and production efficiency.”

Khalid Al Rabiah, CEO of Methanol Chemicals Co. (Chemanol)



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Today, the petrochemicals industry is the largest non-oil sector in Saudi Arabia, with over 26 complexes, boasting existing investments of US\$63.5bn and providing about 84,000 jobs. The majority of Saudi's non-oil exports consist of petrochemicals, which include downstream plastic production and building materials. Total investments in the plastic sector have reached US\$50bn. "With a wealth of experience and skills accumulated over the past 40 years in oil and petrochemicals and an abundance of resources, Saudi Arabia has an edge over its peers regarding product quality and production efficiency. It is very well positioned in the global petrochemicals market," says Khalid Al Rabiah, CEO of Methanol Chemicals Co. (Chemanol) in Dammam.

Diversification in the Kingdom

Saudi Arabia's current strengths lie mainly in producing basic petrochemical building blocks like ethylene and methanol (accounting for two-thirds of total capacity), followed by other feedstock: propylene, benzene, xylene, butadiene and toluene, respectively. However, various projects are now underway to diversify its petrochemicals portfolio towards more sophisticated, high-value-added speciality chemicals, such as engineering thermoplastics, performance polymers, industrial rubber, acrylics, and sulphonated naphthalene formaldehyde. Recent products include ethanolamines (used in consumer products and industrial processes) and ethoxylates (used in shampoos, cleaning/personal care products, as well as in textiles, agricultural and oil products). The vision is to develop Saudi Arabia as a global leader in new advanced polymers by the end of this decade.

Saudi Arabia is leveraging low crude prices to accelerate development of its downstream petrochemical derivatives sector, while adding more than 30mn tons of new capacity by 2020, therefore raising production to 126mn tonnes from 2014 levels of 94.6mn tonnes, according to the latest edition of The Oil & Gas Yearbook. It is estimated Saudi Arabia will be producing more than 115mn tons by end-2016.

The government has announced plans to invest nearly US\$95bn over the next decade to build new plants, expand existing ones and integrate refineries with new or existing petrochemical units.

Global multinationals, namely Total, Dow Chemical Company, and Chevron Phillips, are collaborating with Saudi Arabian companies to develop fully integrated mega-complexes for petrochemical production. Capital expenditure worth US\$50bn by 2020 across three major projects and two expansions are being planned or implemented. The Sadara chemical complex in Jubail Industrial City II and PetroRabigh 11 located near King Abdullah Port on the Red Sea are two such keystone developments.

Landmark projects

Sadara Chemical Company – a joint venture between Dow Chemical Company and Saudi Aramco – is currently building the world's largest chemical complex in a single phase, with 26 manufacturing plants (producing more than 38 products). The project (costing US\$20bn) is expected on-stream in 2016/17. Its sales volume is projected to reach US\$10bn yearly. Sadara will be the first Gulf chemical producer to use naphtha as a liquid feedstock. In 2013, Sadara signed agreements with several banks for a US\$10.5bn project financing.

Petro Rabigh II – partnership with Japan's Sumitomo Chemicals – has transformed Aramco's Rabigh Refinery into a fully integrated petrochemicals facility, producing a range of high-quality fuels (including gasoline). It also produces 1.3mn tons of ethylene and has a capacity of 900,000 tons/year of propylene, according to Petro Rabigh.

Another huge scheme devised jointly by SABIC and Aramco is plans for developing the world's largest oil-to-chemicals plant (costing US\$30bn), for which a feasibility report is being prepared. When completed by 2020, the facility will process about 200,000 bpd of crude oil and feed the offtake into three steam crackers. One will crack liquefied petroleum gas and natural gas liquids, a second will crack naphtha and a third will crack fuel oil.

The product slate of the three crackers includes benzene, butadiene, ethylene, propylene, toluene and xylene, which will be fed into downstream processing facilities at the complex. There are cost factors: oil-to-chemicals plants require abundant supplies of fuel, which in turn, needs heavy subsidy, bringing the crude used for power down to US\$36/tonne, equivalent to the US\$0.75 a million BTUs the Oil Ministry charges for ethane in industrial use.

Global slowdown and price competition

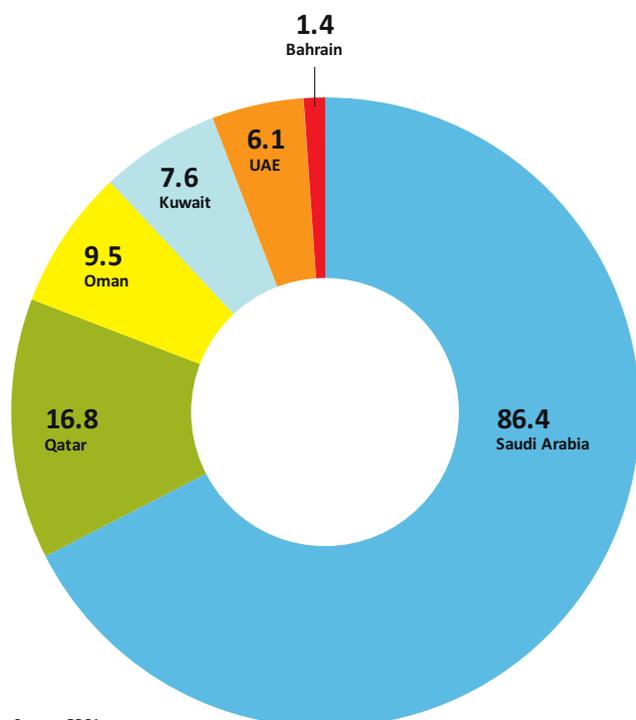
A weak oil price usually hurts regional producers by eroding their comparative pricing advantage over rivals in Europe and North America that use oil-derived feedstocks such as naphtha in order to make petrochemicals.

The petrochemicals market is sensitive to global output growth because its products – plastics, fertilisers and metals – are used extensively in construction, agriculture, industry and in the manufacturing of consumer goods. Amid stronger industrial activity in emerging economies (until recently), the sector enjoyed higher utilisation rates and firm prices. Now with local end-markets such as automobiles, construction, plastics and appliances slowing down in Asia (notably China), producers are seeing lower sales volume.

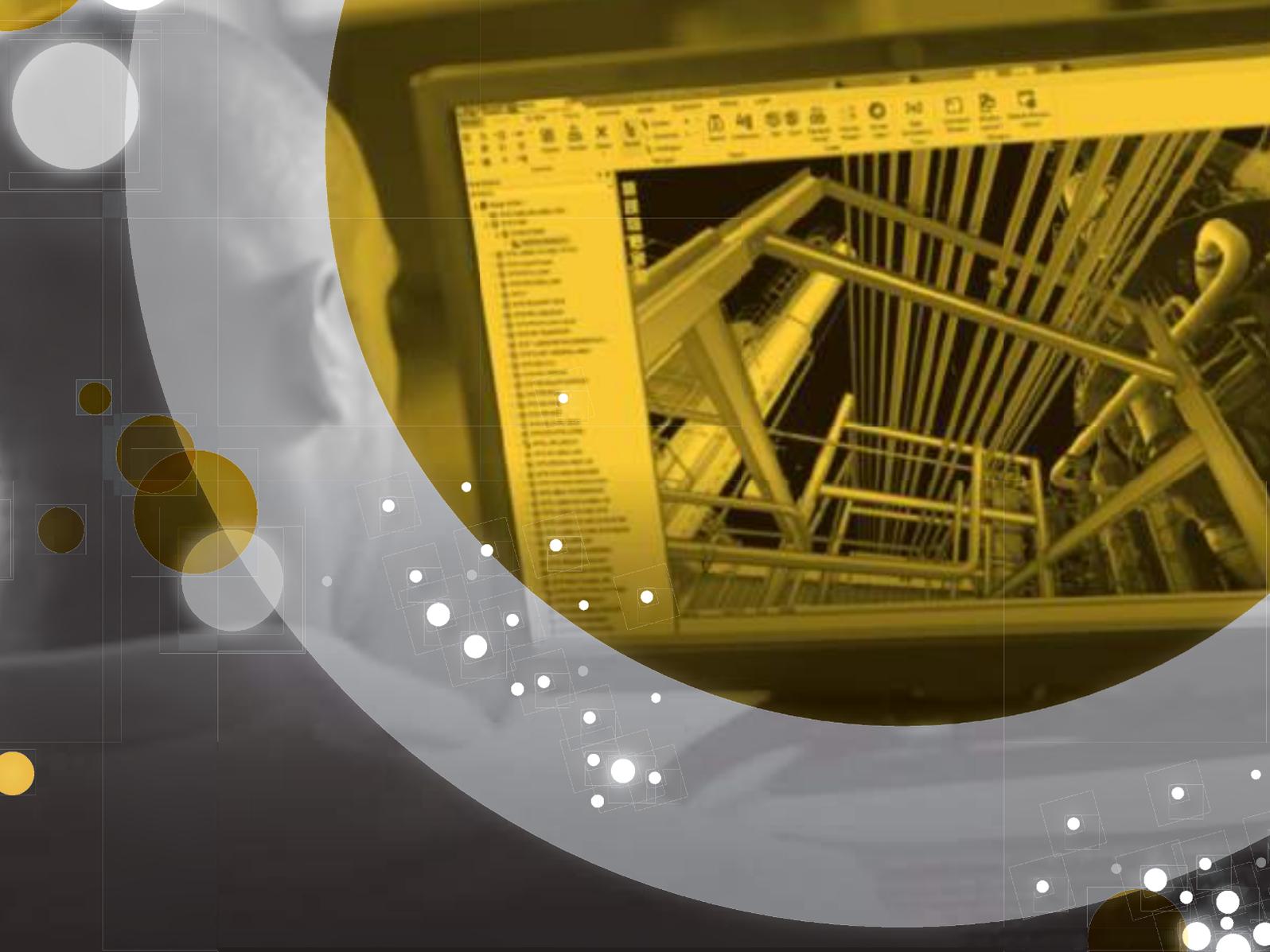
Saudi Arabian producers face other challenges, including higher gas extraction costs and booming shale gas US production, which are affecting Saudi Arabia's competitiveness. With no new commercially viable gas deposits reported in recent years, the use of unconventional deposits will require more complex/expensive technologies. Furthermore, there is likely to be an increased squeeze on gas feedstocks due to soaring demand from power-generation and water desalination sectors in coming decades – reflecting the country's high population growth and ongoing industrialisation drive.

A 2014 report by consultancy firm McKinsey pointed out while the availability of low-price gas feedstocks led to rapid growth of the

GCC Petrochemicals Capacity by Country (2012 - million tons)



Source: GPCA



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Middle East's petrochemical industry over the past 30 years, but "with advantaged new gas supply expected to end in most countries in the region over the next few years, petrochemical producers that want to expand domestically face major challenges". Saudi Arabia, however, needs further upstream expansion to sustain growth and bring cost pressures under control.

Projected growth in Saudi Arabian capacity will be led by demand from its key export market China. The Asian powerhouse is expanding its domestic capacity, including a total of three million tons/year of ethylene, while it is also experiencing slower consumption growth. Added to overcapacity is the potential for increased Iranian output as sanctions are eased. Moreover, weak oil prices have led to a decline in the supply of naphtha, prompting falling profit margins for the ethane-fed petrochemicals industry.

Reasons why Saudi Arabia is a global hub for future petrochemicals:

- Saudi Arabia is the only GCC country to allow private investment (including foreign direct investment) in the petrochemicals industry. Private-sector contribution is expected to quadruple in the next decade.
- Affordable energy and low-cost raw materials offer attractive project economies, coupled with long-term supply security.
- World Trade Organisation (WTO) membership allows free access to new export markets for Saudi petrochemical producers – strategically located to serve vast markets in both Europe and Asia.
- Rapidly developing petrochemicals clusters offers lucrative business opportunities for services providers. Saudi Arabia is also developing new industrial parks for plastics conversion to stimulate investments and create jobs.
- World-class infrastructures in Jubail and Yanbu are undergoing continuous upgrades – with new projects in roads, railways, airports and seaports, which will save costs when transferring products and materials from land to sea.
- Additional supply and diversification of petrochemical derivatives create new value chains and attractive opportunities for downstream industries.

With more industries in the Eastern Province than in the rest of the GCC-bloc combined, the ongoing development of clusters and push into petrochemicals derivatives will strengthen local downstream capacities and increase the scope for technology transfer partnerships with foreign majors, value-added services as



The economic slowdown in China, along with its plans to increase its domestic capacity of a number of chemicals, is already adversely affecting the Saudi Arabian petrochemical sector (Photo: Christian Lagerek)

well as support national professional employment goals. Some 1.9mn Saudis are expected to enter the labour market over the next decade. However, to sustain the robust growth trajectory, capital expenditure in the petrochemicals sector is poised to rise further, with a view to improving the country's performance and global competitiveness in manufacturing, supply-chain management, marketing, sourcing and services. Gulf countries need to invest more in R&D to help boost the value of their products.

“Projected growth in Saudi Arabian capacity will be led by the demand of its key export market China”

Saudi Arabia is actively encouraging foreign investment to help bolster its status as a global petrochemical leader and a number of highly integrated refining and petrochemical schemes are expected to leverage its competitive advantages in the next few years. The mega-projects currently being pursued, notably Ras Tanura Integrated Refinery and Petrochemical Complex, Sadara, and Petro Rabigh Petrochemical Complex, will soon enable Saudi Arabia to rank among industrial giants such as the US and China in terms of market size.

Looking ahead, the industry is forecast to grow at six per cent/year, with GCC production reaching 198.6mn tons by 2020, based on the current pipeline of petrochemical and downstream construction projects. "The drive into higher value products, such as specialty and performance chemicals, is gaining momentum and is expected to act as a catalyst for an even stronger growth of the GCC petrochemical industry in the years to come" noted GPCA. ■



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Saudi Aramco goes local

Saudi Arabia is looking to rely more on its local talent pool - its people, technology, goods and services - to grow its oil and gas sector, says Martin Clark.

SAUDI ARABIA'S VAST energy infrastructure is entrusted to state oil and gas company Saudi Aramco, the world's leading oil producer. The kingdom has in place a nominal production capacity of 12.5mn barrels per day (bpd). This is based on the resources from a large number of oil fields, including the world's biggest, Ghawar, in Eastern Province.

Despite the current subdued oil market, with prices way down on their former \$100-plus per barrel level, Aramco continues to produce at consistent levels, with no intention of easing back, it seems.

That was the message recently from its chairman Khalid al-Falih. "There have been no conversations here that say we should cut

production," he said in a recent interview with the Financial Times.

Moreover, despite the company's huge production capacity and surplus, the long lead times facing the industry and the high costs

“ Saudi Aramco plans to double to 70 per cent the proportion of goods and services it sources from the local market by 2021”

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involved mean it is always important to consider forward investment plans. That is a point recognised by Falih and his team at Saudi Aramco. The company's significance in supporting world oil markets mean that these are decisions management and the Saudi Aramco board cannot afford to get wrong.

Indeed, the oil giant recently announced plans to spend \$300bn on its supply chain over the next 10 years, both in maintaining existing facilities and developing new ones.

Local know-how

Significantly, however, the state oil company is looking to step up its use of local contractors and resources to make this happen.

Encouraging more local content in the industry is nothing new, of course. It has long been a theme across the Gulf and other developing regions to offset the dependency on foreign expertise and foster a more sustainable industry.

But Saudi Aramco is cranking it up to a new level with plans to double to 70 per cent the proportion of goods and services it sources from the local market by 2021.

Saudi Aramco's chief executive Amin H. Nasser outlined the so-called In-Kingdom Total Value Add (IKTVA) programme recently, calling it a "step-change" in the group's commitment to local content development throughout the supply chain.

"Sourcing a majority of materials, goods and services that we require locally will enable Saudi Aramco to not only embed greater competitiveness and efficiency in our operations, but will also help us fulfil our potential in support of the kingdom's growth, job creation and economic diversification objectives," he said.

He also believes IKTVA will create mutually beneficial partnerships between Saudi Aramco and all suppliers. "The scale of our diversified energy business and associated capital expenditure programmes clearly create significant opportunities for those suppliers ready, willing and able to invest in Saudi Arabia and partner with Saudi Aramco on a long-term, sustainable basis," he said.

The new sourcing initiative puts local companies right at the heart

of Saudi Aramco's enormous procurement process.

As well as raising the percentage of locally-manufactured energy-related products used in the industry, it is meant to create additional jobs and even lift the export of Saudi-made goods and services overseas.

That's good news for Saudi industry and job seekers given the massive annual spend of Saudi Aramco right across the domestic energy sector.

Economic boost

Most recently, that spending power was in evidence for a series of contracts to build the new Fadhili gas plant north of Jubail in Eastern Province.

Saudi Aramco signed contracts covering three separate packages with Spanish firm Tecnicas Reunidas (for the inlet and gas treatment, and process utilities packages), and with Petrofac International for sulphur recovery units.

In another major project, Germany's Auma also secured a large order for more than 400 electric actuators and gear boxes for the Al-Wasit gas programme, Saudi Aramco's development scheme for the Arabiyah and Hasbah offshore fields in the Gulf.

These are initiatives that will go on even in the face of lower oil prices, reflecting the long-term growth plans for Saudi Aramco and Saudi Arabia's energy sector.

Upstream initiatives

In the field, Saudi Aramco continues to seek ways to make the most of the kingdom's tremendous hydrocarbon potential, above and beyond known resources.

Despite huge proven reserves, this includes exploration of new and untested areas such as the search for oil and gas in the offshore Red Sea, where early studies have now been completed.

Rough sea-floor topography and complicated geology under thick salt deposits make it an intriguing area for exploration, though a practical challenge lies in preserving the fragile balance of the area's pristine ecosystem.

"We think the Red Sea is a key, under-explored region that has the potential to meet the Western Region's demand for oil and gas, but there are special technical challenges," said Ibraheem M. Assa'adan, vice president of Saudi Aramco's exploration department, at a recent industry workshop on the area.

Here, Saudi Aramco is partnering with other technical agencies such as King Abdullah University of Science and Technology for a greater understanding of the area.

However, not all of its recent projects have been fruitful, such as the frustrating search for new gas deposits in the so-called Empty Desert region, which has seen disappointing results and major foreign partners depart in recent years.

Gas development

This gas quest was driven in part by Saudi Aramco's long-term strategy to switch local energy production to natural gas, instead of more costly liquid fuels like crude oil.

That strategy also incorporates the Fadhili plant which, when completed, will become a key component of the kingdom's Master Gas System.

This aims to meet growing domestic demand for energy by expanding from its current 9.3bn standard cubic feet per day (scfd) of sales gas in 2015 to 12.2bn scfd by 2021.



It is hoped that the development of the kingdom's gas resources will boost industrial development (Photo: zhu dhifeng / Shutterstock)

The plant will process 2bn scfd of Hasbah non-associated gas and 500mn scfd of Khursaniyah onshore non-associated gas.

It is expected to produce 1.5bn scfd of sales gas and 4,000 metric tons per day of sulphur. It will also provide an additional 470mn scfd of gas to fuel an adjacent cogeneration plant, which will provide the plant power and steam requirements and to export about 1,100MW of power.

It forms part of a trio of projects - the Wasit, Midyan, and Fadhili gas plants - which together will add more than 5bn scfd of non-associated gas processing capacity.

According to Saudi Aramco, this will open new opportunities for Saudi industries such as steel, aluminium, petrochemicals, water desalination, electricity and downstream products. ■

Level playing field

Saudi Aramco's new local content initiative raises the stakes in terms of how suppliers to the world's biggest oil producer respond to projects and tenders. It applies to all international and domestic suppliers, including manufacturers and service providers.

IKTVA aims to provide a level playing field for domestic and international suppliers through greater consistency and increased transparency during the applications process. On a practical level, the programme will first establish a three-year baseline score for each supplier measured against key metrics for local content and value creation. After this, Saudi Aramco and suppliers will jointly develop an IKTVA action plan to increase these scores and overall impact, with performance tracked on an ongoing basis.

A new function - the Industrial Development & Strategic Development Supply Department - has also been created within Aramco's materials supply division to champion the IKTVA programme and optimise the supply chain. "Through IKTVA we can and will do much more to deepen our local manufacturing and supply chain capabilities," said Nassir al-Yami, manager of the new Industrial Development & Strategic Supply Department. "We are encouraging a local supply chain that has deep roots here in the kingdom and is committed to being part of our future success."

“The new sourcing initiative puts local companies at the heart of Saudi Aramco's enormous procurement process”



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Sadara starts up first solution polyethylene plant in the Middle East



Sadara chemical facility in Jubail Industrial City II

SADARA CHEMICAL COMPANY (Sadara), the world's largest chemical complex ever built in a single phase, has successfully started up its first production plant, moving on schedule from the construction to the operational phase.

Sadara's first product – Linear Low Density Polyethylene (LLDPE) – was produced in the company's polyethylene plant using proprietary technology from The Dow Chemical Company. The plant is the first Solution PE plant in the Middle East and is designed to produce products for specialty applications such as the manufacture of food grade plastics, industrial and consumer packaging and health and hygiene films.

Ziad Al-Labban, Chief Executive Officer of Sadara, thanked all those involved in making the Sadara dream a reality, saying, "The successful start-up of the first production facility is a major milestone for Sadara, thanks to the great teamwork between Sadara's employees and with the support from our stakeholders and partners."

The plant is the first to come on stream among the 26 world-scale manufacturing plants that are being built in the Sadara complex in Jubail Industrial City II. "We are continuing with our commissioning and start-up efforts to bring the remaining 25 units on stream safely, efficiently and effectively," Al-Labban added.

Sadara has to date achieved more than 60 per cent Saudization as construction of the Sadara complex reached 97 per cent completion by November, 2015.

Sadara, a joint venture developed by Saudi Aramco and The Dow Chemical Company, is building a world-scale chemical complex in Jubail Industrial City II, which will be the first in the Middle East to use refinery liquids, such as naphtha, as feedstock. By using best-in-class technologies to crack refinery liquid feedstock, Sadara will enable many industries that either currently do not exist in Saudi Arabia, or only exist through the import of raw materials.

Saudi Aramco launches new R&D centre

SAUDI ARAMCO HAS launched a research and development centre in Michigan, Detroit.

Located in the city of Novi, it is one of three Aramco institutions in the United States. The new centre "further strengthens the company's global fuels research programme", claims the company.

The programme has the goal of promoting the development and adoption of efficient, sustainable and affordable transport solutions for the future.

The research and development facility will focus on creating new fuels that combine with the engines of the future.



Saudi Aramco president and CEO Amin H. Nasser, centre, inaugurates the new research centre

Spanning 50,000 square foot, Aramco will employ 50 professionals at the facility. It also has other R&D facilities in Paris, Aberdeen and Beijing in addition to the USA and Saudi Arabia.

Last year, one of its research centres won Technical Innovation of the Year award for its nanoparticle development.

Calling fuel technology a "critical area of research", Amin H. Nasser, president and CEO, said the company is "refining to invest in innovative solutions that will significantly improve efficiency and lower emissions from the well-head to the wheel".

HoA signed for Indonesia refinery

SAUDI ARAMCO AND Indonesia's state-owned PT Pertamina have signed a Heads of Agreement (HoA) to formalise key business principles for joint ownership, operation and upgrade of the Cilacap Refinery located in Central Java, Indonesia as part of Pertamina's Refinery Development Master Plan (RDMP). The signing was held during the Indonesian vice president's inauguration of the newly commissioned Residual Fluid Catalytic Cracking (RFCC) facility at the Cilacap Refinery, and the launch of the Blue Sky project, both of which are designed to produce higher quality gasoline.



Saudi Aramco president and CEO, Amin H. Nasser and PT Pertamina president, director and CEO Dwi Soetjipto sign the Heads of Agreement

The proposed Cilacap Refinery upgrade will enable the refinery to process more sour crudes, meet high quality product specifications (Euro IV) and produce basic petrochemicals and lubricant base oils. The capacity expansion to 370mn bpd will help Indonesia meet its increasing demand of refined products, lubricant base oils and petrochemicals. The agreement includes a long-term supply agreement for Arabian crudes to Cilacap refinery.

"Indonesia is a rising powerhouse in the global economy, and it has long deep-rooted cultural ties with Saudi Arabia. Its refining sector has enormous potential, and with Indonesia's fast-growing demand for refined products, Saudi Aramco's role in Cilacap can help fuel this country's coming era of development and prosperity," said Amin Nasser, president and CEO of Saudi Aramco at the signing ceremony.

Participation in the RDMP will go a long way in helping Saudi Aramco to realise its global downstream expansion aspirations, designed to make Saudi Aramco the world's leading integrated energy and chemicals company.

Saudi Aramco has also been selected by Pertamina as strategic partner to upgrade and expand two other refineries in Indonesia.

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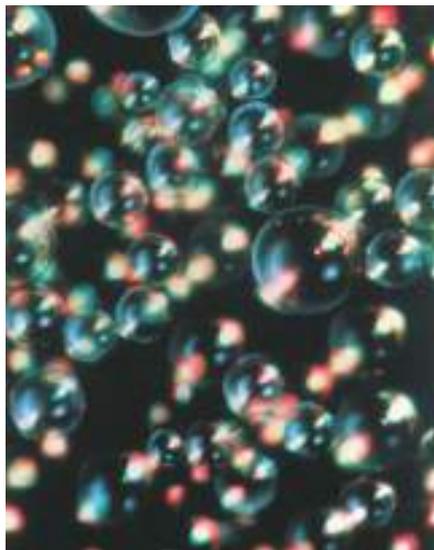
3M extends its commitment to Saudi Arabia

International science-based company 3M is cementing its presence in Saudi Arabia with the launch of a Customer Experience Centre focused on the oil and gas sector, and the ground breaking of its first manufacturing facility in the Kingdom.

IN THE CURRENT low oil price environment, many companies are drawing in their horns and putting investment plans on the back burner.

But not 3M. In a move designed to bring the company closer to its customers and signalling its faith in the long-term prospects in Saudi Arabia, 3M has launched its Customer Experience Centre dedicated to the oil and gas industry and celebrated the ground breaking of its first manufacturing facility in Saudi Arabia and the Middle East located in Dammam Third Industrial City.

The oil and gas industry is a key focus for 3M in the Kingdom. The company has more than 10,000 products that are used at all points across the industry, from advanced materials to personal safety. These range from lightweight glass bubbles for reducing the density of downhole cements to high-performance coatings for corrosion prevention in extreme environments, and



3M's products for the oil and gas industry include lightweight glass bubbles for reducing the density of downhole cements

“ We are looking to take normal applications and make them more effective ”

from personal and environmental safety solutions against chemical and mechanical hazards, to specialty polymer processing additives for vehicle components.

With its culture of creative collaboration, 3M's strength lies in continually creating, reinventing and adapting products and technologies in response to industry demand.

According to Nicholas B. Brunet, general manager, Industrial, 3M Saudi Arabia, the manufacturing facility, which will be developed in three phases, will share knowledge and global best practice with key stakeholders of Saudi Arabia's oil and gas sector, such as Saudi Aramco, thereby helping them to build efficiency and upgrade their processes, at a time when there is a demand for innovative solutions to cope with the challenges of the downturn. In the best traditions of 3M, it will act as a platform to develop new processes and products with customer input, as well as to gain an insight into future trends and demands.

“3M was founded on these principles; our customers come to us, and we develop solutions,” Brunet explains.

The facility will focus on two main areas, he says, the first being safety, a cornerstone of the company's offering. “How to make the job safer, keep employees safer, is a key focus of 3M. We have a division handling safety aspects, both upstream and downstream, and our products span the entire gamut of HSE, from hard hats, earplugs and harnesses to breathing protection,” he says.

The other key area will be well



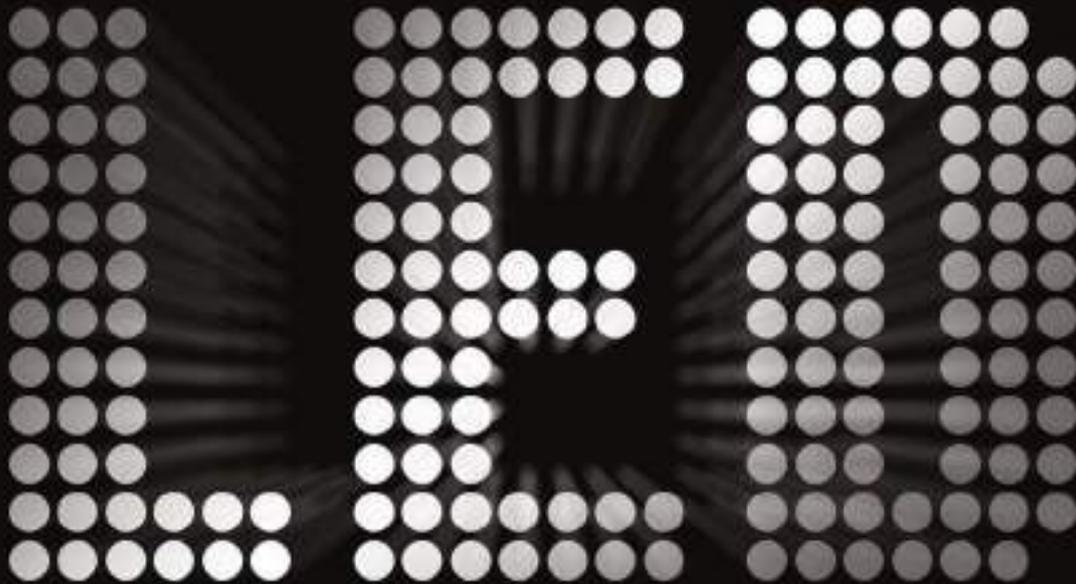
Nicholas B. Brunet, general manager, Industrial, 3M Saudi Arabia

stimulation, cementing and drilling. “Here we are looking to take normal applications and make them more effective, building efficiency into the process,” Brunet explains. “This is where 3M can really add value.”

With the manufacturing facility, it will be the first time 3M is putting down bricks and mortar in Saudi Arabia, says Brunet. It makes sense both in view of 3M's core capability as a manufacturing company, and in terms of the contribution it will make to localisation and the employment of Saudi nationals, a strategic Saudi government priority, thereby helping to cement the company's position in the Kingdom.

“The Saudi Government has been a tremendously supportive and facilitated the process for us,” says Brunet, adding that the venture has benefited from the engagement of Saudi ministers and the US consulate. ■

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Withstanding the downturn

Around 180 companies from 25 countries showcased their latest technologies and services at the seventh edition of the Saudi Arabia International Oil and Gas Exhibition (SAOGE), held at the Dhahran International Exhibitions Centre from 23-25 November 2015.

ORGANISED BY IES Srl and Dhahran International Exhibitions Company, the show attracted leading industry players such as 3M, China Petroleum Technology & Development Company, Al Estagamah Global Group Trading & Contracting Co Ltd, Abdullah H. Al-Shuwayer Sons Group of Companies and Saudi Chemical, as well as smaller specialised companies. Approximately 60 per cent of participants were from the Kingdom itself.

The event was inaugurated by Khalid bin Mohammed Al-Batal, undersecretary of the Eastern Province, on behalf of HRH Prince Saud bin Naif bin Abdulaziz, Governor of the Eastern Province.

Mohammed H. Al-Hussaini, CEO of Dhahran Expo, highlighted the role of focused exhibitions such as SAOGE in bringing together international companies with the latest technologies in the oil and gas industry, and expanding opportunities for development through partnerships and international agreements.

A broad spectrum of products and services were represented, from pumps and valves to inspection services and cutting edge robotics. Dräger's new wireless gas detector and Midwam Edutainment's interactive, virtual reality simulation training programmes, were just a couple of the innovative technologies on display. Working in partnership with the USA's EON, Midwam is a good example of the growing number of local companies involved in the high-tech sector.

The event represented a barometer of the state of the Kingdom's oil and gas industry, with a prevailing feeling of a



The inauguration ceremony (Photo: IES Srl)

slowdown in business. Many companies reported that their order books were suffering as a result of the shelving and postponement of major projects, with suppliers being squeezed on costs. Companies with diverse portfolios, and those with a focus on maintenance and services, have been less hard hit. Protecting assets and avoiding costly new expenditure is the order of the day, as many companies observed, with solutions that can help to reduce costs in demand.

Mohammed Zaki Ahmed, sales manager at Abdullah H. Al-Shuwayer Sons Group of Companies commented, "The market is not as good as before and companies are rethinking their investments. But if you're in industrial services, you can survive."

Despite the downturn, a number of companies at the show were looking to expand their presence in the Kingdom. International science-based company 3M has announced the opening of a Customer Experience Centre dedicated to the oil and gas sector in Dammam, while Sharjah-headquartered Unique Group, the integrated subsea and offshore solution provider, is establishing a new facility in Dammam in response to customer

demand for products and support services to be provided locally.

Several companies new to the market found SAOGE an effective way of raising their profile and exploring the market potential, such as Greece-headquartered Atom Arabia, which recently entered the Saudi market and was encouraged by the interest shown at SAOGE in its heat treatment, blasting and NDT services.

A noteworthy feature of the show was the presence of women on the stands. The three young Saudi women on the stand of Saad M. Al-Alyan Est for instrumentation and calibration were very positive about their experience of working with the company, and the encouragement they have received. The women are involved in the assembly of pressure gauges, training and working alongside men.

"We are very proud of these young women, who have shown they have the ambition to prove themselves and are outperforming the men," said business development manager Eng. Mazin Al-Alyan.

This trend could be set to continue, with many companies increasingly looking to employ women to achieve their Saudisation targets. ■

“A number of companies present were looking to expand their presence in the Kingdom”

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'Look at TSM ARABIA for quality process equipment in the Middle East'

EXHIBITING FOR THE third time at ADIPEC 2015, Titanium and Steel Manufacturing Company (TSM ARABIA) manufactures products like shell and tube heat exchangers, pressure vessels, towers and columns, reactors, dearators, storage tanks, skid modules and pipe spools. Established in 2011, the company manufactures various types of process and heat transfer equipment utilised by a client list that includes Saudi Aramco, SABIC, SWCC and others.

According to Yasser N Mohammed, sales and marketing manager, TSM ARABIA is a US\$26.6mn JV between Saudi Steel Pipe Company (70 per cent) and TSM Tech from Korea (30 per cent).

The company came into being in response to the high demand for process equipment for downstream and energy operations in the Middle East.

"We now want to focus on high-end materials like titanium alloys, nickel alloys, super alloys and special materials like Hastelloy, Inconel and Monel because there are no specialised manufacturers in the region for this kind of metallurgies and we face competition mainly from foreign manufacturers, especially Koreans," Mohammed asserted.

Speaking about more support to local manufacturers, he added, "It would be great if decision makers at industrial authorities in Saudi Arabia and the GCC, whether private or public, extend more support to local manufacturers for the region in order to achieve industrial growth. There must be regulations that give preference to local manufacturers for regional projects."

With oil prices dropping lower than US\$50 in November 2015, Mohammed said that this did not deter their decision to come to ADIPEC. "The event being the largest oil and gas show in the world, this meeting point is a great opportunity to meet potential customers, suppliers and technology owners from different

TSM ARABIA is planning Phase Two expansion of its Dammam facility (Photo: TSM ARABIA)



countries, and also look at investors to plan expansion in the region. We plan to also expand across the globe. We currently have a facility in Dammam 2nd industrial city but we have a five-year expansion plan that might take place if market conditions permit. TSM Phase 2 plan would include the construction of a larger state-of-the-art manufacturing facility that would enable us manufacture particularly oversize equipment, a wider product mix, and, of course, more production capacity." Realising the strong demand for process equipment that TSM ARABIA manufactures, Mohammed noted that there is a greater call for expansion.

TSM Arabia is certified by ASME for 'U' 'U2' 'S' 'PP' stamps and by national board for 'R' stamp. It is also registered as an approved vendor by end users such as Saudi Aramco, SABIC and others. The majority of its current order book are for three main projects in Saudi Arabia – Jazan Refinery, Jazan integrated gasification combine cycle plant and the Fadhili gas programme.

REDA: Customisation is our strength

LEADING FIRE, SAFETY and security company REDA Hazard Control made its debut at ADIPEC 2015 in November, showcasing its fire hazard unit at the show.

REDA Hazard Control manufacturing plants specialise in customised engineered product lines including fire protection equipment and systems, vehicles and trailers, skids and containerised solutions. Reda Hazard Control is also maintaining an alternate manufacturing location of TYCO Fire Suppression & Building Products Novec 1230™ and FM-200® clean agent fire suppression system. Speaking to *Oil Review Middle East*, Sabah Yusuf, business head of manufacturing, said, "This allows REDA Hazard Control to supply systems from stock inventory held in the country, but also to provide improved after sales service and refill capability. Our in-house engineering service, coupled to manufacture and supply, has uniquely positioned us to serve our customers in the region."

Yusuf noted that the company started the manufacturing facility in 2007 to mainly cater to Saudi Aramco, SABIC and petrochemical facilities in the Kingdom.

The specialisation that sets REDA apart is customisation and catering to client

requirements. "We do not make regular or batch products. In fact each product line is unique. Whether it is fire hose reel and rack cabinet for Saudi Aramco and SABIC or sheet metal fabrications for airports, it is made according to client requirements."

With a team of 1,200 employees, including 300 experienced engineers, Yusuf said that the company has a very good presence in the biggest oil and gas market, Saudi Arabia. "We make respiratory protection equipment, containerised solutions, PPE as well as calibrations for the domestic clientele in the Kingdom."

The company also provides inspection and preventive maintenance services in addition to safety equipment.



REDA's fuel transfer truck. (Photo: REDA)

Another aspect that REDA strictly adheres too is supporting and encouraging localisation. "As a growing company, we give a boost to the regional economy as well. We, as a company, have a social responsibility towards regional employment," noted Yusuf.

HSE practices in the region

Yusuf said that in most cases, REDA follows client's practices on HSE standards but having two manufacturing units also entitles it to have its own safety practices. "Our main purpose is to protect lives and properties. It is more about familiarisation with the hazards we face."

Featuring at ADIPEC

Participating at ADIPEC gave REDA Hazard Control focused exposure to the regional customers in oil and gas industry. "We have received some good enquiries at ADIPEC and as we are strategically located in the region, we are confident that that gives us an upper hand among our US and European competitors."

Apart from oil and gas, REDA also serves the power, mining, water treatment, transportation and construction sectors among others.

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Ingersoll Rand reveals new dedicated Man Rider® Winch

INGERSOLL RAND, A global leader in compressed air and gas, power tools, material handling and fluid management, showcased a new addition to its line of dedicated Man Rider winches at ADIPEC.

The new MR150 Man Rider winch includes the most built-in safety features of any of Ingersoll Rand's dedicated Man Rider winches and features rugged construction and advanced engineering to withstand the brutal environments of oil and gas operations, in accordance with the company's focus on safety, reliability and durability and the demands of the market.

The company also showcased the latest high-torque tools from its QX Series™ of cordless tools. The QX Series delivers the right tool for the right job in industries that require high accuracy for fastening and connecting parts, whether in the heavy equipment, light manufacturing, automotive or aerospace sector, says the company.

Ingersoll Rand products range from complete compressed air systems, tools and pumps to material and fluid handling systems. The diverse and innovative products, services and solutions enhance its customers' energy efficiency, productivity and operations, says the company.



The MR150 Man Rider winch

Joint Yoochang's effective piping solutions

SOUTH KOREA-BASED COMPANY Joint Yoochang Thermal System Co. Ltd. piping solutions provide a more reliable system to carry oil and gas, steam and water more safely in industrial facilities.

Catering to companies like Oxy Oman and Kuwait National Petroleum Company (KNPC), the company is also looking to enter the UAE market. ADIPEC 2015 certainly gave a boost to its chances, according to the company's overseas sales executive Hyun-Mo Koo who said that at this year's event he has received inquiries from companies like GASCO and ZADCO.

Joint Yoochang's joints are designed for safe additional packing injection under full line pressure especially with a number of slip joints being applied to district heating and energy service pipelines.

Mo Koo said, "Our thermal joints are innovative. Many customers associate piping with bellows, but our thermal joints play a better role than that. Our pipes have better absorption rate for transferring fluids effectively and in-built maintenance tools that ensure repairs can be done without hampering pipe operations. This saves money and downtime costs. for our clients.

"Our major projects are not just with oil and gas companies, we are also associated with the largest building in the world – Burj Khalifa, as well as many buildings in Asia."

Looking to expand reach further in the region, the sales executive added that Joint Yoochang will register as a vendor in the Middle East region to soon start selling its own products, which are currently being distributed by vendor companies.

Products that the company manufactures include expansion joints, injection slip joints, injection ball joints, injection multi joints, injection sink joints, underground sink joints, ball joints, slip joints and multi joints.

Pelican lighting solutions for a safer work environment

PELICAN PRODUCTS, MANUFACTURER of advanced portable lighting and high-performance protective case solutions, presented its latest lighting solutions, including new EU ATEX Safety Certified lights and USA Safety approved torches, at ADIPEC 2015.

Pelican's advanced lighting tools are made for professionals working in the oil and gas, fire and rescue, mining, pharmaceutical, hazmat and other high-risk industries. The company offers over 50 lights with USA safety approvals and European ATEX Certification.

The Pelican solutions included:

Peli 9415Z0 LED ATEX Zone 0: Pelican's most powerful rechargeable lantern, approved by ATEX Zone 0 (Cat. 1), complies with the new 2015 ATEX regulations. Weighing 1.65 kg and 392 lumens, the 9415Z0 LED Lantern features four LEDs powered by Ni-MH batteries. Innovative features include 120° rotating head, run time of 11 h (low) and 4h 30m (high), battery status indicator, 3-mode switch (high, low, flashing), rechargeable battery, and shoulder strap.

Peli 3715 LED ATEX Zone 0 (Cat. 1): This right

angle light with downcast LEDs for better illumination features 189 lumens (high), 90 lumens (low) and 23 lumens (downcast). This light complies with the 2015 new ATEX regulations. The built-in battery life indicator lets the user know the light's battery level at any time. Compact, rugged, and lightweight, the 3715Z0 LED light contains the latest technology available.

Peli 9435 Remote Area Lighting System:

The 9435 is ATEX Certified Zone 2 (Cat. 3) for use in hazardous locations. It features 18 LEDs and a beam spread of 90° that effectively lights a large area. It offers two brightness settings that shine 1,500 lumens for five hours in high-setting and 750 lumens for 10 hours in low.

To improve customer experience in the Middle East, Pelican Products also announced the opening of its first distribution centre in the Middle East. The new logistics centre includes new offices which will act as Pelican's base for their recently expanded local team.

Piero Marigo, EMEA managing director at Pelican Products, said, "With the new distribution centre, Pelican can now store inventory in the region to optimise customer



Pelican's most powerful rechargeable lantern Peli 9415Z0 complies with the new 2015 ATEX regulations (Photo: Pelican Products)

service, improve delivery times and make smaller shipments economically viable. "And, with our newly expanded sales and customer service team in place, our company is well-positioned to help accelerate our customers' business."

Additionally Pelican Products has selected Danzas (DHL) as its third party logistics partner. "DHL is known for its expertise in transportation, customs and entry/export documentation which, of course, will be of great service to our existing and new customers." added Alex Spaans, director of supply chain and operations EMEA at Pelican Products.

Piping solutions from Raccortubi

At this year's ADIPEC, Raccortubi Middle East received a positive response, despite the unfavourable market conditions.

AT THE BEGINNING of 2015 Raccortubi Group acquired Petrol Raccord, manufacturer of standard/customised butt weld fittings in stainless steel, duplex, superduplex, superaustenitics and nickel alloys up to 56", almost without wall thickness limitations. With this acquisition, the stockist / manufacturer has been able to complete its production range and therefore offers customers a more comprehensive service.

It is as a result of the integrated production within the group, that Raccortubi Middle East is able to provide its customers with increased cost efficiency. Raccortubi stocks consist of fittings direct from production, as well as pipes, tubes and flanges, meaning that the firm can fulfil complex customer requests to short timescales. Items in stock at Raccortubi Middle East already come hand-in-hand with the relevant quality certifications/approvals, and all orders are personalised according to client requests.

Sunzeev Swami, managing director of Raccortubi Middle East, explains the concept, "It means that the customer can take one less step. We do the legwork in terms of manufacturing, sourcing the best materials at the best price, and bringing everything together, including any special or additional needs that the customer may have. We are a one-stop-shop."

Raccortubi Middle East fulfils projects for piping materials in a variety of industrial applications such as chemical and petrochemical plants, oil installations, power plants, shipyards, urea plants and offshore platforms. As part of Raccortubi Group, it is combining a full



Raccortubi undertakes projects for piping materials in various industrial applications

product range, dedicated customer service, speed and order personalisation to give customers the best response to their requirements. Swami further expands, "Our constant goal is to achieve high quality, quick delivery times and customer satisfaction for the lowest possible price." ■

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Empteezy brings customised oil and gas safety solutions to ADIPEC 2015

UK-BASED INTERNATIONAL company Empteezy made its presence felt at ADIPEC 2015 in November at Abu Dhabi with its tailor-made spill control and spill containment products.

Rod Smith, regional director at Empteezy, said, "We are the biggest manufacturers of absorbents in the UK and with our products tailored to meet the requirements of a variety of different working environments including industrial, commercial, military, marine and universities, we manufacture in excess of 70 per cent of the products available in our portfolio in our own factories."

The only company to be accredited with ISO 9001, ISO 14001 and ISO 18001 international standards, Smith said, "We complete the circle – how to contain, respond and decontaminate hazardous materials."

Bringing to ADIPEC specialised products like temperature controlled-showers, galvanised steel pallets, absorbents, Smith also gave an insight on the products that are most in demand. Partnering with similar manufacturers like US-based companies, namely Justrite and Speakman, the company has a worldwide reach for products like showers, containers for flammable liquids and lifts, among others.

Talking about customised showers, Smith said, "What we have brought unique to the market is the heat-traced shower that in freezing conditions, will protect the equipment from freezing. Our heat-traced emergency safety shower is protected against freezing by means of trace heat cabling and an insulated jacket which gives protection down to -25°C."

In an emergency situation fast access to a fully compliant emergency safety showers is vital, he added.

Emergency face wash basins are another featured product by Empteezy at the show. Also built for desert conditions, the state-of-the-art emergency eye/face wash basins can be docked on a truck and are designed to provide emergency response to eye and/or face contamination anywhere, even in the middle of the desert.

Increasing HSE practices in the Middle East region have created an upbeat market for Empteezy. According to Smith, a decade ago



The ABS plastic basin is fitted with aerated sprays for eyewash comfort and innovative face pads for full face cleansing while the water flow is activated by a large stainless steel push handle with a stay-open valve for hands-free operation. (Photo: Empteezy)

things were different in the region but now there is legislation in place to drive the demand for personal protective equipment as well as safety products.

Particularly happy with the response at ADIPEC 2015, he revealed, "There is great demand for our products in the region, and, so far, we have got a good response. This really encourages me to book for next year's event as well."

Bosch brings innovations to control production costs

BOSCH'S REXROTH DIVISION has brought to the Middle East market for the first time an innovative electro-hydraulic artificial lift system (R7) to enhance heavy oil extraction, and the Hägglunds hydraulic drilling motor to make complex drilling possible at lower speeds for greater efficiency.

Showcased at ADIPEC 2015, these new technologies in oil production and extraction boost well production and create cost efficiencies. The dual innovations – the R7 and the Hägglunds motor – simplify heavy oil extraction from aging wells at greater volumes, and make the process of drilling more energy and cost efficient respectively.

The R7's characteristics includes easy installation and a smaller footprint. It is also equipped to be controlled remotely and its condition can be monitored, supporting more consistent long-term performance and productivity. The R7 includes overload protection, which avoids polish rod breakages and its flexibility increases well productivity.

The Hägglunds motor is a low-speed high torque hydraulic motor with infinitely variable speed used for onshore drilling applications characterised by a compact drive system and high power-to-weight ratio that boosts its ability



The Hägglunds motor by Bosch Rexroth (Photo: Bosch)

to perform at low speeds. The system's efficient performance also saves operational costs across its total lifespan, says the company. Sherif Shaheed, sales manager of Bosch Rexroth Middle East said, "Bosch has brought to market two solutions that we believe will help regional producers address some of their efficiency gaps and improve their processes. These two technologies represent the best of

Bosch's solutions that are tailored to the evolving oil and gas industry in the GCC region. "We are seeing continued investment in oilwell innovation in the Middle East as producers look to keep costs under control and extract more for less. "Our solutions are built to support this process and sustain the industry's profitability over a long period of low prices."

Schlumberger's mobile testing unit offers efficient flow rate measurement

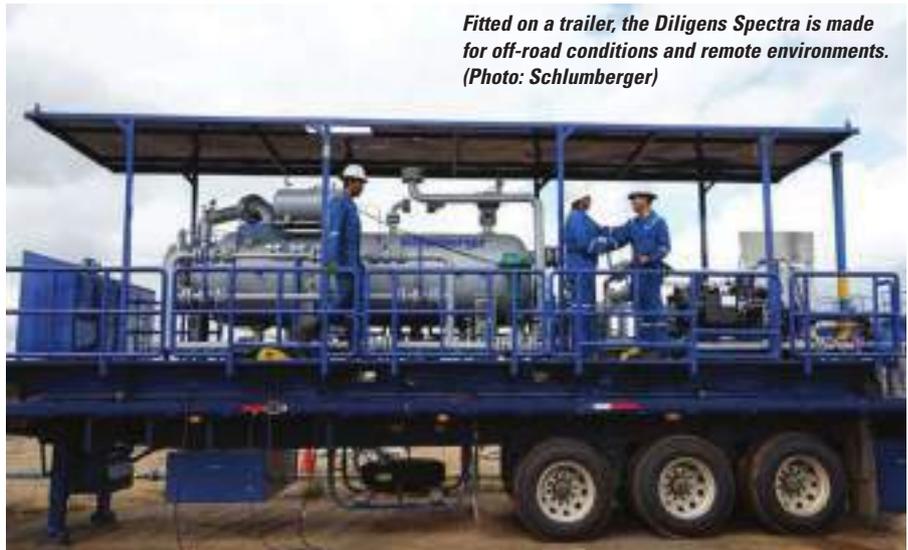
MOBILE MULTIPHASE PRODUCTION testing unit – Diligens Spectra – by Schlumberger was showcased during ADIPEC 2015. The displayed unit was the latest modified version of the product that has been in the market for 15 years.

Fitted on a trailer, the compact and modular design of Diligens Spectra provides agility and mobility, allowing the operators to test multiple wells per day.

Equipped with two Vx Spectra surface multiphase flowmeters on the trailer – 19mm and 40mm venture throat sizes – it also provides repeatable flow measurement in any multiphase flow regime and in production fluids ranging from heavy oil to wet gas.

The flowmeter is the only multiphase flowmeter that measures in high frequency at a single point across the venturi throat, thereby avoiding the conventional combination of measurement from multiple locations and flow rate conditions throughout the system.

Vitaly Senic, product champion at Schlumberger, said, "The Diligens Spectra is a very high frequency measurement system. As soon as you hook up to the well, it starts the metering. The system was commercialised in the year 2000 and we have continuously improved upon it. With the Vx Spectra, operators can measure any



Fitted on a trailer, the Diligens Spectra is made for off-road conditions and remote environments. (Photo: Schlumberger)

flow and any type of fluid with this meter – fluid or gas or even water from any well."

He added that with reservoir dynamics constantly changing, producers now need to make recovery strategies.

The Middle East is a strategic business point for the company, and the region has equally responded to Schlumberger. "The Middle East is the region that adapted the Diligens Spectra system, especially the UAE which has played a very important role,"

Senic noted.

The benefits of Diligens Spectra include improved fluid characterisation services, inline metering without the need for separation, enhanced response time, accurate flow measurement of oil and gas and even water under challenging conditions like foam and heavy oil. It also helps in reducing the cost of the operator by eliminating the need of a separator and a crane onsite.

UAE firm begins DNV-approved sling manufacturing

UAE-BASED SAFETY Services Group (SSG) has started the manufacturing of Det Norske Veritas (DNV) 2.7-1 approved slings for the offshore oil and gas industry.

DNV approval has been introduced to standardise the quality of lifting equipment used by offshore companies. Before DNV 2.7-1 standards were applied, individual oil companies had imposed their own requirements but this proved impractical and costly in terms of inference and implementation. The unified quality assurance has been a major benefit for manufacturers and users of slings and other equipment, according to SSG.

Speaking with *Oil Review Middle East* at ADIPEC 2015, Mohamed Basheer, president at SSG, said, "The high standard demanded in the manufacturing of slings for offshore requires us to observe stringent measures in order to meet market needs. DNV-complied slings are now easily available within the region substantially reducing procurement cost across the lifting industry.

The fabrication of 103mm flemish eye slings of 60 metres was carried out at the



Mohamed Basheer is the president at SSG. (Photo: Safety Services Group)

company's Dubai facility and was given a go-ahead by DNV approved representative after a proof load tested in 1,000 tons tensile test bed.

Basheer added, "With over 36 years in the market, we have established ourselves as the leaders in providing fast and efficient turnover of high end lifting products and

services. Our specialist engineers ensure that our processes, technology, and knowledge are optimised to meet leading global standards."

The company also announced that it has major expansion projects coming up across the Middle East and Asia within the next two years.

Facing tough challenges

Ibrahim Al-Alawi, deputy CEO of leading Abu Dhabi-based oilfield services company AlMansoori Specialized Engineering, speaks to *Oil Review* about coping with the challenges of the downturn.

IT IS A tough environment for oilfield services companies right now. While oil and gas activity remains at a high level in the Middle East in comparison with other regions of the world, the downturn in the oil price has meant that the region's oil and gas companies are making cutbacks, and AlMansoori is feeling the pinch.

Ibrahim Al-Alawi comments, "The operators are still investing, and are committed to big projects. Abu Dhabi is adding one rig a month, and this is set to continue until 2017. The situation is similar in Saudi Arabia, and in Kuwait the level of activity is even higher. Our company continues to grow, and here are a number of exciting projects underway which provide scope for business." He gives as an example the CO2 injection project in Abu Dhabi, where the company is well placed to supply the well monitoring tools needed.

"However our clients are putting pressure on us to reduce our prices. Whereas over the last few years there has been a welcome shift away from price as the sole determining factor in awarding contracts, towards the total value proposition, that trend has now been reversed – it's all about the bottom line again. We may be able to propose solutions that can save the operators money in the long run – but they are looking for something that is cheaper today. My biggest fear for the future is that the momentum towards favouring the value proposition may be lost."

The influx into the region of service companies suffering from the downturn in the USA and elsewhere is exerting a further downward pressure on prices and creating more competition, he adds, expressing concern about the impact a price war would have on the industry.

AlMansoori still faces the same challenges as when the industry was booming, says Al-Alawi, highlighting in particular the difficulty of recruiting skilled manpower, with oil and gas professionals



Ibrahim Al-Alawi, deputy CEO, AlMansoori Specialized Engineering

continuing to command high salaries in the region. "But now we face the additional challenge of how to continue growing with less revenue, and how to reduce costs without impairing the quality of our service. It's making us think outside the box – what worked yesterday might not work tomorrow. For this reason we have coined the slogan 'B the change' for 2016, to encourage our people to change the way they think and work, to see how we can do more with less."

One of the first companies in the Middle East to introduce a certified fully-integrated HSEQ management system, AlMansoori prides itself on its strong HSEQ culture, and

Al-Alawi is adamant that this is one area in which the company will be making no cutbacks. "Given that our people are central to the delivery of quality, we are doing everything we can to keep our employees happy and engaged. We are not releasing staff or cutting back on training," he stresses. And while the message 'no compromise on health and safety' came over strongly at ADIPEC, he fears that companies lacking a strong safety culture may be tempted to cut corners given the pressure to reduce prices.

"Health and safety comes at a cost, but that cost is a necessary one. As the saying goes, "If you think safety is expensive, try having an accident."

If there is a silver lining to the downturn, it is perhaps that it is spurring more industry collaboration – a theme highlighted at ADIPEC. For AlMansoori, it is resulting in the creation of new alliances and relationships. While the company has always collaborated with international companies to introduce new products and technology into the region, a new development is that the company is now being approached by other services companies – international, regional and local – to explore possibilities of working together to deliver services at the reduced prices demanded by the market.

"For example, it might work out more cost-effective for us to deliver services on behalf of an international service company, rather than for them to bring in their own people. Or sometimes it makes sense for another service company to do a job on our behalf, if they have some equipment that we don't have. We look at the economics on a case-by-case basis, to see whether it works for both parties.

Everyone is looking at how they can keep costs down, and this tough environment is forcing everyone to be more collaborative.

"While this approach has been driven by necessity, who knows where it might lead?" he muses. ■

“ Now we face the additional challenge of how to continue growing with less revenue

Two high value services from DNV GL

AN OIL MAJOR in the Middle East has recently contacted DNV GL's jack-up service centre asking for assistance to carry out a detailed study on their jacking systems. The oil firm said that it is worried about the safe operations of the jack-ups operating in its fields and plans to carry out a study on nine of its jack-ups. This is mainly based on DNV GL recommended practice on inspection and maintenance of jacking systems RP 0075, in addition to the customer's specific requirements to identify failure modes and the effect on their operations, which is based as per DNV GL RP D102.

The customer has requested DNV GL to carry out a detailed study on the remaining fatigue life of the units, which have aged, and also to carry out a crew competence audit. These jack-ups were sold and resold many times and in this process the operational history of the units has been lost.

Noble Denton's Jack up & Geo technical centre in London holds the biggest seabed database, including actual jack-up penetration records, as well as the biggest metocean database. The company also has the operational history of the majority of jack-ups that operate globally, and has existing in-house models of legs and spudcans of most of the designs using its own software. The customer found that DNV GL was the best choice in terms of knowledge, experience, local support, speed, and cost and found the DNV GL database to be valuable.



Bijali Nair, DNV GL regional offshore class manager - Middle East

"Gathering the best data and combining them to offer the best services will be the future of high value engineering services and is not what used to be," said Bijali Nair, regional offshore manager – East Mediterranean, Caspian, Middle East and India.

Marine Cybernetics

More and more rigs and ships are becoming automated and automation comes with very complex software, which ideally needs to be tested with its hardware. Software may fail during operation, which costs millions of dollars in lost revenue for the owner as well as the end customer. Rig and ship owners are utilising DNV GL Marine Cybernetics services using hardware-in-the-loop (HIL) testing in DP, power management, steering, propulsion and thruster, vessel

“ Noble Denton's Jack up & Geo technical centre in London holds the biggest seabed database, including actual jack-up penetration records and the biggest metocean database

management systems, BOP, ESD and drill floor, which is a form of insurance against undesired incidents and non-productive time. HIL testing is an efficient and powerful method for testing control systems using simulator technology, which acts as a real time "virtual world" for control systems by modelling the vessel, its systems and environment. HIL targets protective safety barriers that are impossible or dangerous to test onboard or otherwise will not be tested until they are needed.



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Multiphase flow metering - a look ahead

Despite the huge advancements in meter development, there is still considerable scope for improvements in accuracy and reliability. Emmelyn Graham, flow consultant at NEL, discusses the future for multiphase flow meter technology.

TRADITIONALLY, TO ACCURATELY measure a complex mixture of oil, water and gas, test separators were used to separate the flow into individual component streams and which were metered separately. However, there are many disadvantages to using test separators, including high capital and operating costs. Multiphase flow meters were first introduced in the early 1990s to overcome some of these issues, while enabling the development of marginal assets as well as increasing the efficiency and exploitation of larger fields.

Multiphase flow meters generally rely on one of two methods: either compact separation and measurement of individual component streams, or measurement of the bulk flow rate of the multiphase mixture and calculation of the individual phase fractions without separation. However, separation-based meters usually have a much larger footprint, making them unfeasible for offshore and subsea installations.

Confidence in this emerging technology was initially undermined as the first generation of multiphase flow meters did not meet their over-hyped performance claims. It has taken many successive iterations of meter design to gradually gain industry confidence in their reliability and performance claims.

Technology advancements

Today, multiphase meters are reasonably well accepted for reservoir monitoring as costs have come down and they are better able to monitor individual wells in real time, while the need for maintenance and well shutdowns for testing have fallen.

Although multiphase flow meter technology supports the economics of developing marginal fields, it also helps with a major shift to subsea production in deeper waters, reducing the need for platforms and improving well testing. Confidence in the technology has advanced so much that many new field developments do not have test separators.

Despite the huge advancements in meter development, there is still considerable scope for improvements in accuracy and reliability. Materials and sensors need to be robust and able to cope in harsh subsea environments, including withstanding sand entrainment in flows which come with deeper water developments. The high power demands and communication bandwidth required by some multiphase meters can also make them unsuitable and limit their use in subsea applications.

“Today, multiphase meters are reasonably well accepted for reservoir monitoring”



Multiphase meter undergoing testing at NEL's multiphase flow measurement facility

Understanding multiphase metering technology is essential to predict the effects of potential flow assurance issues, production upsets, and unexpected changes in the metering values of erroneous metering readings. The art of multiphase flow metering is in the selection and optimisation of the sensors and the combination of their data to give an accurate measurement.

Different sensing methods have been used in multiphase flow, ranging from differential pressure devices, gamma densitometers, capacitance, microwave and ultrasonic sensors. However, many commercial meters have now adopted a similar strategy, including a blind-tee or a similar mixing element, a Venturi, a densitometer and/or capacitance measurement.

Cross-correlation of sensor data can also be used to determine flow velocity. While this industry homogenisation to a single design is a practical solution to meet current flow-metering requirements, the future of multiphase flow-metering will be driven by the industry's need to develop cheap, lightweight, flexible production systems that efficiently and safely exploit increasingly difficult fields.

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New developments

The development of four-phase meters (to include sand monitoring) will assist in detecting and mitigating flow assurance issues relating to erosion in subsea infrastructures. This is an increasing problem due to the higher sand content from deeper waters.

Many multiphase meters use radioactive sources to determine fluid densities. This can create issues with regards to the safe handling and transportation of sources, lifetime of sources, increased paperwork and compliance with regional regulations. Multiphase meters that do not use radioactive sources, but can prove to be similarly reliable, robust and accurate would therefore be greatly welcomed by the industry.

Prototype tomography-based visualisation systems are in the final stages of development and laboratory testing. These will be critical in the future for identifying flow assurance issues, such as slugging, i.e. accumulation of water, oil or condensate in a gas pipeline.

Going subsea

Installing subsea multiphase meters can reduce the cost of piping infrastructure and allow individual well monitoring so that operators can use shared pipelines if the well is metered before co-mingling. Many field developments have omitted the use of traditional separators to measure multiphase flow due to the high costs, hence the growing reliance on multiphase meters.

The drive to develop deeper subsea wells increases the cost exponentially, hence why operators are so keenly focused on the reliability of multiphase meters installed subsea, especially in times of reduced oil profits, as the cost of repairing or replacing failed subsea equipment is prohibitively expensive. The trend for deeper water wells, longer subsea tie-backs and increased distance to processing facilities means that subsea equipment must be robust and able to cope with extreme conditions.

Flow assurance issues can have a major impact on the reliability of subsea multiphase flow meters. Issues include the formation of hydrates, waxes, scaling, slugging, chemical deposits, erosion and corrosion. Failure to quickly identify and mitigate these problems can cause serious damage to equipment, affect measurements, and have catastrophic consequences in terms of safety, production and reduced revenue. In some cases, multiphase meters can be used to identify certain flow assurance issues. However, subsea sampling of multiphase fluids helps in identifying potential flow assurance problems to mitigate risks.

When installing a multiphase meter subsea, the three Rs of reliability, redundancy and retrievability become crucial as subsea interventions are so expensive. It is, therefore, a requirement that a multiphase meter can function for long periods of time before maintenance.

Heavy oil

Another challenge for flow-metering technologies today is that the majority of the world's remaining oil reserves are classed as heavy oils. Most modern multiphase meters have been developed for oils with relatively low viscosity, whereas heavy oil can have a viscosity of 10,000 centipoise or more, which is likely to be highly sensitive to temperature. It has been shown that most conventional multiphase meters need to correct for the effect of liquid viscosity in heavy oil applications. To date, very few multiphase meter technologies have been validated in multiphase heavy oil conditions and there are limited testing capabilities.

Similar issues apply when emulsions are present, and only certain multiphase technologies are able to accurately measure these types of flows. The ability to handle flow with emulsions is expected to become increasingly more important.

Future applications

Over the past few years, new clamp-on technologies have emerged that allow retrofitting and temporary installations, including subsea



There is a growing reliance on multiphase meters in subsea production (Photo: iurii/Shutterstock)

multiphase meters which can be retrieved by remotely operated vehicles. If successive iterations prove to be reliable, then these would form a new generation of multiphase flow meters.

The industry is keen to implement downhole measurement technology. However, innovation and research is still required in this area to develop robust and integrated systems. While some downhole flow meters have been deployed, this is still very much at an early stage of development. These could supplement or replace traditional multiphase meters, especially as their accuracy increases as downhole instrumentation and data transmission methods improve.

“Multiphase flow-metering techniques have continuously evolved to meet industry needs”

Virtual flowmeter technology is being implemented by many operators. This is software that combines distributed measurements to calculate the flow rate. For example, the pressure drop across a choke, wellhead temperature and the downhole pressure could be used as inputs. The benefit is that these systems can be easily integrated into existing infrastructure and may eliminate the need for additional hardware in the future. Well and pipework flow simulation software is also being integrated into these systems and the resultant real-time modelling will offer major opportunities for understanding and optimising production systems. Multiphase flow meters have also been used to tune virtual flow metering systems, which have then been used as back-ups if there are issues with multiphase flow meters and to diagnose potential changes and issues.

In conclusion

Multiphase flow-metering techniques have continuously evolved to meet industry needs, and their use is expected to increase due to the advantages and reductions in cost they deliver. Currently, the use of multiphase technology is cost-prohibitive, but, if cheaper technologies emerge, this will pave the way for increased uptake in the technology and the installation of one meter per well. While initially focused on measuring how much oil and gas is being produced, multiphase flow meters will evolve to be about reservoir engineering, sand management, leak detection, process optimisation, condition monitoring, allocation and integrated production management. ■

Consultancy NEL, which is part of the TÜV SÜD Group, provides on-site measurement, testing and calibration, research and development and training services to the global oil and gas industry. NEL maintains and develops the UK's National Flow Measurement Standards on behalf of the UK Government.

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Making reservoir monitoring matter

Tendeka's advanced completions technical manager, Iain Lees, and director, John Hunter, explain how the company's reservoir monitoring systems have added intervention capability and fully wireless intelligent completions.

THROUGHOUT ITS HISTORY, the oil and gas industry has driven technology advancements in order to maximise returns while operating in increasingly challenging environments and times. Of all the technological progress of the last few decades, the evolution of electronics and information technology may be the most significant in shaping and benefiting the industry.

Reservoir monitoring, through the various techniques of instrumenting wells and using the acquired information, has come a long way from early methods, where the application of technology, data quality and run-life left a lot to be desired.

It is widely accepted that an effective reservoir monitoring system can deliver significant benefits, including reduced uncertainty, improved understanding of reservoir changes, monitoring of pressure draw-down over time, better pressure build-up recording and understanding of cross-reservoir communication. Fully understanding sub-surface activities, reacting to changes, or even planning ahead to avoid or mitigate them, add to field life and can avoid costly intervention.

Current systems have brought together the very latest developments in technology, communications systems and software to provide reservoir engineers with a live view of downhole activity. Modern downhole monitoring systems allow operators to benefit from reduced well intervention costs associated with acquiring bottom-hole pressure and temperature data, enhanced oil recovery, improved safety and reliable



Iain Lees, advanced completions technical manager, Tendeka

reservoir surveillance. However, with an abundance of technologies readily available, the challenge lies in selecting the most reliable and optimal tool for the application.

Matching requirements

It is crucial to ensure that the reservoir monitoring system adopted matches the requirement exactly. In this current low oil price market, and with ever more challenging harsh environments to combat, getting that decision right is more important than ever, and could ultimately save millions of dollars.

Initially, it is important to understand what the operator wants to achieve from the reservoir. Is it maximum production in a short period of time? Or is the requirement more for sustained, longer-term production levels, with the focus on enhanced life, possibly changing functionality, such as from oil to gas production, or from producer to injector over their lifetime?

Is the up-front cost of the system the critical factor, or is it the potential to enhance value over time that an efficient system can bring?

What data does the operator require



John Hunter, director, Tendeka

from the reservoir, and how will this information be used? What's the end goal for the reservoir? How can the reservoir monitoring system be best utilised to help improve the company's bottom line?

Reservoir monitoring solutions have traditionally been understood as a permanently installed cabled system. The Tendeka technology portfolio incorporates these, while adding intervention capability and fully wireless intelligent completions.

Guardian range

In permanent monitoring, Tendeka has developed its Guardian range, incorporating both fibre optic and electronic downhole monitoring.

Utilising distributed temperature-sensing fibre optic cable, Guardian DTS provides the fastest measurement speeds available and coverage of up to 50km from a single channel, while the surface acquisition unit delivers data which is easily accessible and available in real time. Guardian electrical monitoring systems comprise of a range of downhole gauges and surface equipment that delivers high-resolution permanent

“It is crucial to ensure that the reservoir monitoring system adopted matches the requirement exactly”

monitoring of well pressure, temperature and performance.

In addition, Guardian systems are designed to be installed in a number of environments, with all-weather, harsh environment surface units designed for use in desert, offshore and sub-zero conditions. Systems provide user flexibility as they can be configured and operated remotely through a network interface. This option of reservoir monitoring offers detailed analysis of a well or an instant snapshot of activity, depending on the degree of information required.

Tendeka also provides the benefits of distributed temperature sensing on existing wells, by carrying out Intervention DTS surveys on slickline.

SigNet wireless solution

In situations where information is required from further parts of the reservoir, multi-lateral wells are planned, where retro-fit monitoring and inflow control is needed, or where reducing the number of control lines is crucial, then Tendeka's SigNet wireless solution is the right option.

SigNet is a fully wireless, modular intelligent completion system, made up of any combination of the two key components; wireless pressure/temperature gauges, and wireless inflow control valves. Either component can be permanently installed as part of the completion, or can be retrofitted using conventional intervention tools. SigNet systems use wireless pulse telemetry to enable the ongoing monitoring, control and optimisation of both production and injection wells.

SigNet systems use highly efficient downhole electronics, and communicate with the surface using the well's own

energy resulting in a long operating life. Furthermore, life of well operation is made possible by using the Tendeka Downhole Power Generator.

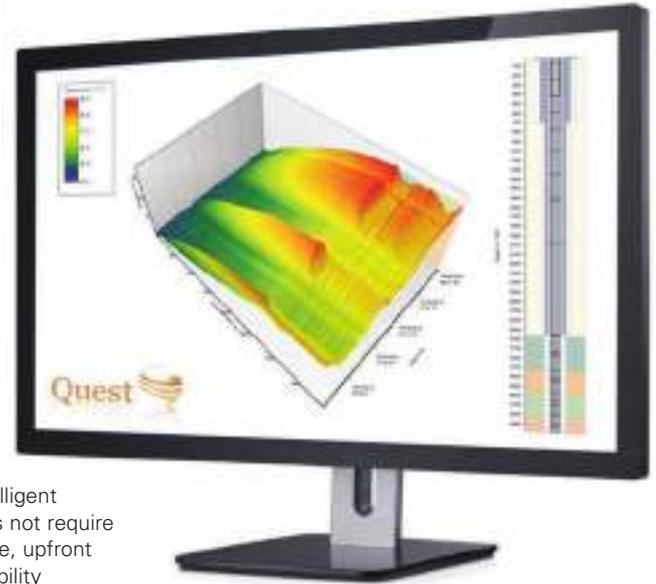
SigNet tools can be installed as close to the production zone as necessary. This means the system can be located within lateral or multi-lateral wells without the need for complex wet connections or expensive inductive coupler technology.

A key advantage over conventional monitoring and intelligent well systems is that SigNet does not require the use of control lines. Therefore, upfront costs are lower, control line reliability concerns are removed, and, when the time comes, well abandonment costs are significantly reduced as the production tubing and control lines do not need to be removed to secure a cement barrier that can be validated against regulatory requirements.

A challenge commonly faced by operators is effectively managing the increased amount of data being recorded. Operators want tools that provide not only comprehensive insights, but also, more importantly, solutions to their problems that are delivered in a succinct way. In order for customers to make the most of their time and well information, Tendeka offers two software solutions:

- DataServer – to store and manage well and field data
- FloQuest – to visualise well data and make it easy to use

In both of Tendeka's systems, what can



Tendeka's FloQuest software enables the visualisation of well data

be done with the data is almost as important as the data acquisition itself. The trend analysis, event detection and alarm activity functions benefit the companies, and can ultimately create a system that is effectively developing its own intelligence and suggesting solutions.

Given the current climate and low price of oil, it is paramount for companies to optimise reservoir monitoring and the abundance of easily accessible data to maximise oil recovery, improve safety and efficiency. Therefore, it is important that operators firstly understand their needs, options available to them, and then select the most appropriate system, which will enable them to make far-reaching decisions to help manage reservoir performance. ■

Tendeka provides a diverse range of upper and lower completion systems and production optimisation technologies to the upstream oil and gas industry. Find out more at <http://www.tendeka.com>.

“ A challenge commonly experienced by operators is effectively managing the increased amount of data being recorded ”

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Driving up profitable downstream dollars

Today's low oil prices have intensified pressure on costs and operational performance for refineries and petrochemical firms. Ossama Tawfick, VP sales, MENA, AspenTech, discusses how advanced planning software can help optimise profits.

WITH ITS AVAILABILITY of low-price feedstock, the Middle East has seen significant petrochemical capacity growth over recent years. The trend towards large-scale refining and petrochemical integration is being driven by joint ventures exporting locally, although target foreign markets are increasingly important for many Middle Eastern companies to add value and secure higher margins. These new refineries in the GCC region need to adopt innovative process industry technology to overcome increasing complexity and to drive efficiency.

Capitalising on potential downstream dollars is essential to remain competitive in the energy industry. Shifting demand patterns caused by volatile crude prices and new energy sources can greatly affect the profitability of a refinery. Therefore, planners must be able to adapt quickly. The use of advanced and innovative planning software can make all the difference by easily identifying more robust planning solutions.

The mismatch between supply and demand has led to a global glut of oil. On the supply side, there is more low cost capacity, while turmoil in the Middle East has not stifled production. There has also been no reduction in output from places like Saudi Arabia or other Gulf states. The current levels of global spare refining capacity indicate there will be a long period of refineries being forced to reduce plant capacity whilst struggling to remain operationally efficient.

Securing every possible dollar downstream can be achieved by implementing advanced planning software as it helps answer the burning day-to-day questions such as which crudes to buy; which products to make; how to capitalise on the new crudes and feedstocks available in the market; and how to effectively manage a complex crude slate with limited storage. Innovative software helps in making the right decisions, increasing accuracy in yield predictions, and reducing maintenance for optimal refinery utilisation.

Making good crude purchasing decisions

Determining which crudes will be most profitable to run on and anticipating product demand require the best planning tools. Reacting quickly to discrepancies between the plan and schedule is also vital to fully exploit profitable decisions in the supply chain and also to be able to capitalise on newly available feedstocks like global shale plays.

“Securing every possible dollar downstream can be achieved by implementing advanced planning software”



Ossama Tawfick, VP sales, MENA, AspenTech

The challenge is that with new crudes and feedstocks on the market, the options become more complex, and decisions become much more difficult. For example, process units can be run in different ways to make different products. As the price of crude changes, those refineries familiar with running 'dirty' crudes might change their operations now that the lighter, sweeter crudes are less expensive. Spot crude opportunities, too, could become available that the refinery might consider purchasing. Therefore, the planner has to be agile enough to determine what crude is suitable, and how to change the plan to accommodate a new feedstock.

Exploiting feedstock flexibility

With powerful planning tools, planners can run more scenarios faster, gain more time for analysis, and respond quickly to traders by

making more robust decisions in a dynamic environment. This enables realistic and optimal targets and accurate planning that potentially increases profits.

For years planners have used model-based planning systems, such as Aspen PIMS™ to help make more optimal decisions – the tool of choice used to plan 75 per cent of the world's refineries. However, historically, it was challenging to find the elusive “global optimum” that spans a large number of refinery operating conditions and different crude types. Many times “local optima” are encountered, which are sometimes difficult to identify. With Aspen PIMS-AO (Advanced Optimisation), planners can now quickly determine a global optimum that leads to improved profitability of refineries.

In essence, there are three key benefits to using advanced planning tools compared to standard applications:

- Performance: run more scenarios faster than ever
- Stability: reduce crudes logistics complexity by determining minimum number of crudes to run using the Feedstock Basket Reduction tool
- Optimum: easily determine the global optimum for the best possible solution.

With the advanced optimisation software, companies can reduce their run times from 30 hours to 90 minutes, which makes an enormous difference to reaching the decision point earlier in the process. Additional time can be spent to further analyse results and different scenarios.

By using newly developed collaborative tools, this sophisticated

“Companies can reduce their run times from 30 hours to 90 minutes”

software system enables planners to deliver optimal plans faster and more easily. They can visualise and evaluate multiple scenarios along with plant data to make better and more profitable decisions. It demystifies the plan by providing clearly displayed data with an easy-to-use interface on a common platform available to all key stakeholders.

Capitalising on downstream dollars

In the decades to come, the refining landscape will be very different. The Middle East will continue to develop refineries for regional and foreign markets, while high capacity from Asia will come on stream delivering low cost competition. Underpinning this trend will be the intense focus on costs and operational performance. Therefore, getting an edge in the energy industry is essential in today's market. The opportunity to capitalise on downstream dollars is achievable with advanced planning software. Being able to quickly analyse and produce different scenarios delivers swift results. By opening the gateway to a world of new opportunities, refineries are better equipped to explore even more ways to optimise their planning, grow their business and boost profits. ■

Aspen Technology is a leading provider of software and services to the process industries. The US company's regional headquarters is located in Bahrain.

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Cyberhawk uses ROAVs to conduct inspections of inaccessible structures such as flares

Taking flight in the Middle East

Cyberhawk Innovations' commercial director Philip Buchan discusses how the company carries out aerial inspections of dangerous, difficult-to-access assets and land surveys through remotely operated aerial vehicles – or drones – for the oil and gas industry.

OIL AND GAS operators around the world own, manage and maintain a huge amount of infrastructure and assets both onshore and offshore. It is essential, and often a legal requirement, to regularly inspect these assets to prevent issues that might result in loss of production and, importantly, the safety of personnel. Regular inspection is required so that these potential issues can be monitored and addressed as quickly as possible.

Inspection programmes can, however, be highly manpower-consuming, can incur significant costs, and, at times, can mean personnel working in dangerous, difficult-to-access environments. In many cases, inspection technicians are required to work at height, and whilst techniques, such as rope access, offer significant safety advantages when compared with scaffolding, risks are still present.

Back in 2008, a team of innovative minds

spotted a gap in the oil and gas inspection market for the use of remotely operated aerial vehicles (ROAV), otherwise known as UAVs or drones. Cyberhawk Innovations, a global leader in the use of ROAVs for aerial inspection and survey, completed the world's first onshore and offshore oil and gas inspections and set drone technology on course for exponential growth in the oil and gas industry.

“ The worldwide commercial drone market is set to reach US\$4.8bn by 2021 ”

Cyberhawk uses ROAVs to conduct close-up inspections of live and difficult-to-reach structures, such as flares, platform

underdecks, internal tanks, chimneys, exhausts and vent stacks. The ability to collect data, including photographic and thermal imagery, with an unprecedented level of detail has seen work for Cyberhawk increase by more than 100 per cent in the last two years.

Headquartered in Scotland, Cyberhawk is a trusted provider to all six oil and gas supermajors, many national oil companies and independent operators, including PDO, ADNOC, SABIC, Dubai Petroleum, Occidental, Oman LNG, Gasco, Daleel Petroleum, Shell and Total. The team of highly skilled ROAV pilots and experienced inspection engineers have worked together to complete more than 10,000 commercial flights, 2,000 structural inspections and 200 live flare inspections, achieving over 25 world firsts, as well as expanding its offering to the renewables, utilities and rail sectors.

Uptake of ROAV technology in Europe has been strong, resulting in Cyberhawk

expanding its global offering, with the launch of offices in the Middle East and Southeast Asia in 2015. From its Abu Dhabi base, and by combining local knowledge, on-the-ground capabilities and inspection expertise, Cyberhawk has completed numerous assignments in Saudi Arabia, Abu Dhabi, Oman and Dubai.

Innovation for the industry

According to a 2015 report from market research and consulting company Radiant Insights, the worldwide commercial drone market is set to reach US\$4.8bn by 2021, and, in particular, it notes that drones have “fundamentally changed the accuracy of utility and oil and gas inspections.”

This growth is attributed to more economical visualisation and navigation provided by drone systems, including mapping and inspection from the air.

Specifically for the oil and gas sector, the ability to conduct multiple work scope inspections on one mobilisation is extremely advantageous. Onshore inspections can include flares, vents, chimney stacks, telecommunication towers and elevated pipework, while offshore this extends to splash zone, risers, the underdeck and derricks on assets, all whilst they are online, in a fraction of the time usually taken by a person. No matter the scale of the asset management programme, operators are able to better plan maintenance and turnarounds, and there are huge efficiencies to be gained.

Cyberhawk has already proven that where a rope access team could take up to 14 weeks to inspect a complex area, an ROAV inspection has been shown to complete the same project in three days. This means increased facility uptime and reduced deferment, leading to major cost savings, maximised production time and improved time schedules.

A further example of the significant efficiencies to be gained is in terms of costs. A recent offshore flare inspection saved the client around US\$2.3mn by avoiding the requirement for an abseiling team and a platform shutdown, which would have taken seven days to complete.

In addition to the time and cost savings on offer, ROAV inspections also provide huge safety benefits. Working at height is the single largest cause of fatalities in the workplace; however, the use of ROAVs significantly reduces this requirement with rope access technicians only being necessary when the aerial inspection has identified that maintenance and repair is required.

Taking flight globally

Legislation around the use of drones in the Middle East, whether it be for recreational or commercial use, is still maturing and gaining

Operating an ROAV from a vessel



the correct permission for the legal operation of a commercial UAV can be challenging.

Cyberhawk has an extensive aviation background and completed commercial assignments in more than 20 countries in the Middle East, Europe, Asia, Africa and North America. Furthermore, Cyberhawk has significant oil and gas experience, with highly trained staff to ensure inspections are carried out safely and efficiently and that the highest-quality reports are produced.

“ In addition to time and cost savings, ROAV inspections also provide huge safety benefits”

Whilst the uptake of commercial drone use has been slower to date in the Middle East than in Europe, as the oil and gas sector increasingly becomes aware of the benefits of ROAV technology, we expect to see many more ‘eyes in the sky’.

Case study

In September 2015, Cyberhawk was tasked by a major oil and gas operator in the UAE with the safe inspection of six flares, 12 vent stacks, multiple bridges, tripods, and telecom towers, offshore in the Gulf.

The rationale behind the operator’s use of ROAVs was to avoid the requirement to shut down platform operations whilst inspections

took place. The operator also wanted to reduce human exposure to hazardous environments, including working at height, as well as remaining a safe distance from the operational assets. Further to this, high quality data was sought to improve maintenance and turnaround planning, in turn supporting management decisions.

The alternative technique considered for the flare tip inspections was using a full size helicopter; however, this method would not have given a comprehensive, 360 degree view of the whole flare such as under the flare deck and supporting structure. The ROAV also meant other difficult inspection work scopes such as bridges, tripods and telecom towers could be inspected on the same mobilisation. Therefore, the use of ROAVs was investigated and deemed to be the preferred method for addressing these issues.

Cyberhawk’s significant aviation experience of operating in more than 20 countries meant it could secure the necessary flight permissions from the UAE aviation authority as well as additional approvals from the local airforce.

A two-man team was mobilised to the platform, consisting of an experienced ROAV pilot and an oil and gas inspection engineer. Detailed inspection reports were then produced by Cyberhawk’s oil and gas inspection team, with additional analysis from its flare expert on the condition of the flare tips. The operator reported that the work was completed safely and efficiently, with high quality reports provided in a timely manner. ■

Turning to technology

A new report from IHS done on behalf of BP looks at how oil and gas operators are turning to technology to cut costs and improve efficiency.

Digital technologies are playing a critical role in improving performance in the oil, gas and petrochemicals sector (Photo: loVE loVE / Shutterstock)

AS PERSISTENT LOW oil prices take their toll on both industry profits and spending projections, oil and gas operators are turning to technology and innovation to reduce costs and improve capital efficiency, while aiming to meet increased future energy demand in a low carbon environment, says IHS, the analytics and strategic information provider.

“Rapid changes in price, such as the halving of the oil benchmark between 2014 and 2015, naturally bring into focus the need for oil companies and their suppliers to reduce costs to maintain viable returns. Technology helps on two fronts,” said Paul Markwell, vice president of upstream oil and gas consulting and research at IHS Energy. “The first is in raising short-term production, the key denominator in the cost-per-barrel equation. The other involves attacking capital costs and operating expenses head on. Both place an emphasis on efficiency.”

Still, investment in oil and gas technology should be viewed as a long game. Producers, Markwell said, must commit to unwavering innovation through the oil and gas price cycles if they are to meet demand safely and at competitive costs through to 2050 and beyond.

Markwell, along with Judson Jacobs, director of upstream oil and gas research at

IHS Energy, was a contributor to the recently published *BP Technology Outlook*, which features their external perspective entitled *Prioritizing Technologies through the Oil and Gas Price Cycles*.

“ Investment in oil and gas technology should be viewed as a long game”

To meet demand and remain competitive, the IHS authors said in the BP report that operators are pursuing a range of cost-cutting and efficiency initiatives including automation and mechanisation of high-cost, repetitive oil and gas activities, such as drilling. They’re also looking to apply data-driven analytics to draw key insights from high-volume data streams, such as detecting when a piece of equipment is going to fail or identifying ‘sweet spots’ in unconventional oil and gas plays. In still other instances, operators are increasing their use of mobility technologies to improve the efficiency and effectiveness of their field workforces.

These same operators are adapting technologies developed in the defense and

manufacturing sectors to address oil and gas requirements, IHS said. Applications include deploying robots to inspect difficult-to-access elements such as offshore risers, and piloting unmanned aerial vehicles (i.e., drones) into areas that are dangerous for human intervention. Another area is process control optimisation, which applies sophisticated modelling and simulation tools to increase production regularity and run equipment and facilities closer to their designed capacities.

Pockets of excellence

IHS has identified several “pockets of technological excellence” that it believes offer the greatest potential to impact near-term oil and gas industry costs. One such pocket has been the exploitation of shale gas and tight oil resources. The phenomenal growth of these resources since the late 2000s can be attributed largely to manufacturing-style continuous improvement technologies and techniques applied to drilling and well completion activities. For example, drilling efficiency in the Eagle Ford play in Texas, USA, rose nearly 150 per cent from 2010 to 2014, as an increasing number of wells drilled provided an opportunity to apply these principles.

“In the lower oil price environment, we



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see an opportunity for producers to mirror these approaches across their broader portfolios by adapting a continuous improvement mindset to their global operations," Jacobs said. "We believe that elements of these same manufacturing concepts can be applied in more conventional oil and gas settings. The keys for producers are to target repetitive tasks associated with well construction and other field development and operational activities with these forms of 'high-iteration learning,' and to deploy the technology (e.g., real-data systems, advanced analytical tools) that can enable it."

“ Digital technologies applied in practice can improve oilfield performance on several fronts”

A common thread running through all these areas, IHS said, is the increasingly critical and enabling role of digital technologies. IHS analysis during the past decade shows that digital technologies applied in practice can improve oilfield performance on several fronts, including increasing oil and gas production by two to eight per cent, reducing facility capital costs by one to three per cent, and lowering operating costs by five to 25 per cent.

Truly digital

As Markwell and Jacobs said in the BP Technology Review, the new emphasis on efficiency places heavy demand on a digital infrastructure that is able to collect, transmit, analyse and act on data acquired through asset operations. It is also setting oil and gas companies on the path to becoming true digital organisations, thereby accelerating a



Drilling efficiency in the Eagle Ford play in Texas rose by nearly 150 per cent between 2010 and 2014 due to technological advances (Photo: Scott Towery)

movement that was already underway. Beyond these digital efforts, there is a host of upstream technology innovations in seismic imaging, drilling and enhanced oil recovery that will help to unlock additional oil and gas resources. However, the industry will need to be nimble to prioritise different technology elements throughout the price cycle.

IHS sees the key to driving the greatest potential return on these types of technological innovations is for companies to focus on the most substantial cost categories within their asset portfolios, and on those technology projects that best target them.

For operators that get it right, the rewards can be substantial. In shallow-water gas projects, IHS identified a reduction in lifecycle cost of between nine and 32 per cent, resulting in savings of \$3 to \$11 per barrel of oil equivalent (boe). In oil sands projects, similar efficiencies enabled a four

to 12 per cent reduction in lifecycle costs, resulting in US\$2 to US\$6 per boe savings. For deepwater oil projects, technology innovations yielded a two to seven per cent reduction in lifecycle costs, or a savings of US\$1 to US\$3 per boe, IHS said.

"These standout results are generating high levels of interest as companies look to dramatically reduce lifecycle costs to allow their projects to move forward," Jacobs said. "Our analysis, coupled with actual industry case studies, demonstrates that real value is associated with technology enabled cost-management strategies. These cost savings are impressive at a time when the pressure is on to dramatically lower costs in order to allow a range of upstream oil and gas projects to move forward." But, the challenge now is for operators to apply these techniques more widely across their portfolios, to drive learning and to leverage economies of scale. ■



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Polarcus develops innovative acquisition system

POLARCUS HAS DEVELOPED XArray, a new and innovative acquisition configuration to deliver superior data quality and make full use of today's larger streamer spreads. XArray improves both in-line shots by 100-250 per cent and cross-line bin density by up to 400 per cent on any streamer separation and can therefore be tailored to provide higher fold data and/or improved acquisition efficiency by up to 50 per cent.

Using Polarcus XArray triple source will provide 50 per cent improvement in operational efficiency and 50 per cent less EHSQ exposure, while increasing unique ray-paths by 100 per cent, compared to a conventional dual source with the same steamer configuration. It will also produce 33 per cent higher cross line sampling density. By acquiring overlapping shot data, interference can also be removed while



The system can be tailored to provide higher fold data.

processing to produce clean shot records of any desired record length.

The XArray Penta with five sources, acquires very dense cross-line samples, producing far more accurate data.

Xodus secures new Zadcovibration contract

XODUS GROUP HAS been awarded its second contract this year from Zakum Development Company (ZADCO) to carry out vibration analysis on its North Satellite Platform and South Satellite Platform, offshore Abu Dhabi.

ZADCO's Upper Zakum operations areas have experienced piping and deck level structural vibration during different loading modes of operations. The work, totalling over US\$400,000, will see Xodus' vibration team provide qualitative and quantitative assessments, conduct a vibration survey, Operating Deflection Shape (ODS) analysis, finite element modelling to verify corrective actions and apply specialist techniques to reduce vibration.

The Zakum field is the second largest field in the Gulf and the fourth largest field in the world. ZADCO aims to increase the production rate from Upper Zakum from 550,000 to 750,000 barrels of oil per day, sustainable for 25 years.

Earlier this year, Xodus was awarded a US\$600,000 contract for the vibration assessment and analysis on the oil train piping and structures for ZADCO at Zirku Island.

New high-pressure seal-less diaphragm pump

WANNER HAS LAUNCHED the Hydra-Cell T8030, a triplex diaphragm pump that it claims eliminates leaks, hazards and the expense associated with replacing seals and packing.

The Hydra-Cell T8030 has a unique diaphragm design that handles more abrasives with less wear than gear, screw or plunger pumps. It can operate with a closed or blocked suction line and can run dry indefinitely without damage, eliminating downtime and repair costs. It can pump up to 98 litres per minute at pressures up to 345 bar.

With three hydraulically balanced diaphragms in a single pump head, designed to handle high pressures with low stress, the pump is also highly energy efficient.

Designed for long life with minimal maintenance, the compact design and double ended shaft provide a variety of



The pump has a lower energy requirement that similarly rated centrifugal pumps.

installation options. The design also allows for easily undertaking the maintenance of valves and diaphragms in the field, without the need for heavy lifting capabilities.

The Hydra-Cell T8030 is available with a choice of nickel-aluminium-bronze or stainless steel pump head materials. The pump can also be configured to meet the requirements of API 674, if required.

Wireless pressure gauge from Emerson Process Management

EMERSON PROCESS MANAGEMENT has introduced Rosemount Wireless Pressure Gauge, the industry's first WirelessHART pressure gauge. The Rosemount Wireless Pressure Gauge enables remote collection of field data, keeping operators updated on changing field conditions and improving personnel safety by reducing manual operator rounds and field exposure. It delivers safer and more reliable readings, enabling better visibility of field changes both in the field and remotely, says the company.



The device minimises operators' rounds in hazardous areas.

Emerson's new pressure gauge utilises field-proven piezoresistive sensor technology to deliver reliable pressure readings. With the flexibility to accommodate changing process conditions, the pressure gauge also gives up to 150 times overpressure protection compared to traditional gauges, which provides for a safer field environment by using two layers of process isolation.

The pressure gauge also eliminates weak points common to mechanical gauges, such as overpressure, vibration, corrosion, extreme temperatures and accidental damage, by removing the components that inhibit the device from reporting/displaying pressure and providing up to a 10-year life, which reduces maintenance cost and time. The large 4.5 inch gauge face provides easy field visibility.

"As part of our Pervasive Sensing portfolio, this new gauge design fundamentally changes how customers use pressure gauges by helping them make better business decisions," said Bob Karschnia, V-P and general manager of wireless products at Emerson Process Management. "Real-time insights provide actionable information that improves personnel safety while reducing facilities' costs and time."

PCM expands in the Middle East

PCM IS A leading supplier of cost-effective artificial lift pumps and systems, which have been developed using its unique Progressing Cavity Pump (PCP) technology. It also offers integrated services for any artificial lift challenges faced in upstream oil and gas production.

Besides a strong commercial and support team, the company's field service provides daily interventions on site to select, install and repair equipment and to monitor and optimise well performances using unique PCM software, PCM Design and PCM field Track. With PCM workshops featuring test-benches and inspection tools, the maintenance teams can also manage the stocks on site.

In the same time, PCM constantly pushes innovative projects.

In Oman, PCM has successfully implemented its high temperature AMPCP (all metal progressing cavity pump) technology, PCM Vulcain™ for thermal recovery. In Kuwait, PCM has introduced its HRPCP (hydraulic regulated progressing cavity pump) technology, PCM Moineau™ HR for wells operating in multiphase conditions with high gas content.

Two new pilots are running at the present time:

One project combines an electric submersible permanent magnet motor (ES) with an HRPCP for an extra heavy crude oil field in Kuwait where gravity is ranging between 17API and 11API, while the viscosity may vary from 10S to 1000S centipoises. The pilot is running smoothly with significant power saving.

The second project is an AMPCP for light Oil (28API) and high flow rate (4000bpd) at 900m setting depth, in the Kurdistan Region of Iraq. The absence of swelling of AMPCP makes it easy to use for any type of light oil, and the pump size combined with high torque sucker rods 1 1/2 allows it to reach the customer production target.



PCM's PCP operation in Oman

PCM has expanded its presence in the Middle East with the opening of a branch office in Dubai in 2006 and the creation of a company in Oman, PCM Muscat LLC in 2010. "Moving close to our customers is key to better understanding their needs. Only with a perfect understanding of your customers' challenges can you offer the most appropriate and innovative solutions," says Nicolas Parise, CEO PCM Middle East FZE. Reflecting this approach, PCM created in 2012 the entity PCM Middle East FZE in Dubai to strengthen its service infrastructure for the whole region.

Graco's XM PFP sprayer approved for explosive atmospheres

GRACO'S XM PFP is a fully certified, out-of-the-box passive fire protection (PFP) sprayer that meets both electrical and mechanical standards for ATEX and IECEx. Intertek Group, the multinational inspection, product testing and certification company, has given the XM PFP system approval for explosive atmospheres.

"Third-party approval by Intermek means the XM PFP can immediately be used to spray the toughest intumescent fire protection material, with no unforeseen delays," says Stephan Rindfleisch, product marketing manager at Graco AFD. "Full approval means exactly that: the XM PFP requires no further individual certification."

This device enables spraying contractors to work quickly and productively, while its weight-based operation mode takes the guesswork out of ratio assurance. The ratio is set and checked by weight and a simple calibration process programmes the machine for the specific materials being used. The machine sprays and displays the true weight ratio of the epoxies, as intended by the chemical manufacturer.

The XM PFP accounts for epoxy PFP material compressibility, which avoids tank pressure tweaking for accurate weight ratio verification. And the weight of PFP sprayed can be tracked in data download,

making it easier to track project costs. Temperature control has also been improved. This means the spray pattern can be achieved faster, which increases productivity, explains the company.

Once the machine is calibrated, repeatable test samples can be run regardless of changes in tank pressures or temperatures. This process is fast and can be completed in less than 90 seconds, claims the company.

The XM PFP sprayer is ideal to apply fireproofing materials in potentially explosive environments such as in refineries, liquid natural gas facilities, petrochemical plants and industrial manufacturing facilities.

Emphasis is on easy, straightforward operation, with an intuitive user interface that provides two display modes: 'set-up' for entering parameters and a 'run' mode for operation. The user interface monitors and tracks mix ratio, pressure, temperatures and flow, and allows the user to programme maintenance schedules. The controls shut down the system if off-ratio conditions exist. The user interface also allows for tracking fluid supply and spray parameters.

Project data can be downloaded onto a flash drive enabling verification that



The weight-based operation mode is a very useful feature of the XM PFP.

materials were sprayed at the proper ratio and meeting the requirements set by the coatings manufacturer.

Graco recently released the next generation, which incorporates several enhancements, including the weight-based operation mode. Other improvements include a simple and repairable hot water-circulating flush kit, a tank heating system that uses only two heater types compared to the earlier four, a multi-zone temperature controller with fewer hardware components for easier servicing and increased durability, more robust I/S level sensors and a new configuration for the feed pump pail wiper leading to higher uptime.

Hempel launches anti-corrosion activated zinc coating

HEMPADUR AvantGuard coating has been designed for to offer protection in harsh marine and saline corrosive environments.

HEMPEL HAS LAUNCHED HEMPADUR AvantGuard, an anti-corrosion protection coating that has wide applications in the offshore oil and gas industry, where many industry assets are located in corrosive environments classified as C4 and C5 according to ISO 12944.

As the conditions for exploration and production get tougher, and with ageing infrastructure requiring more maintenance, advances in corrosion protection and prevention have become an important concern for the industry, in the field of asset integrity. Denmark-based Hempel developed HEMPADUR AvantGuard based on this industry concern, and says that this product offers better performance than most other zinc epoxy primers, and can significantly decrease maintenance costs for installations – especially for assets in difficult-to-access locations, where maintenance and downtime are most expensive.

The technology uses a weighted combination of hollow glass spheres and proprietary activators, which make the zinc available to oxidation throughout the film and so increase electrical contact through the entire coating.

Zinc coatings work via galvanic corrosion, a process whereby one metal will corrode preferentially when in electrical contact with another. As zinc is less noble than iron, it will react instead of the iron when exposed to corrosive elements such as water or oxygen, leaving the steel intact. However, this process requires electrical contact between the zinc particles, and therefore, the protective effect will only occur in the first third of a standard zinc coating.

HEMPADUR AvantGuard uses activated zinc to provide protection to steel structures in saltwater and high humidity environments, in which all of the zinc in the primer is activated to undergo galvanic corrosion. In addition, the process of activation also improves water impermeability. The white salts produced as a result of the activation process fill any



The company received the 2015 MP Corrosion Innovation of the Year Award earlier this year.

space within the film, enhancing the barrier properties of the coating system.

The HEMPADUR AvantGuard coating also contains high levels of chloride ions that are captured as they are diffused from the environment through the film. As a result, the coating makes use of the inhibition effect by reducing the concentration of corrosive agents that reach the steel structure, delaying the start of the unwanted corrosion process. These qualities become even more beneficial in the aggressive saltwater environments of offshore work.

Zinc epoxies are often used on steel structures that are exposed to severe mechanical stress, including extreme temperature fluctuations and vibrations. But in a typical zinc protective system, the zinc primer is the weakest mechanical point. As a result, cracks can form in the coating as the steel expands and contracts.

If a crack forms in a HEMPADUR AvantGuard coating, the glass spheres in the coating absorb most of the impact from the initial crack and stop it from worsening. In addition, the white salts formed during the zinc activation process then occupy the space left by the micro-crack, preventing it from becoming more serious.

HEMPADUR AvantGuard coatings can be applied in both high humidity and high temperatures without blistering, and they are resistant to cracking even with high dry film thicknesses. This improves application efficiency, as it means less reworking is required over welds or in corners, where coatings are often over-applied.

Hempel currently supplies HEMPADUR AvantGuard coating in three variants, HEMPADUR AvantGuard 770, HEMPADUR AvantGuard 750 and HEMPADUR AvantGuard 550. ■

Tough vehicles for demanding applications

TANK International Petroleum Equipment and Instrumentation Co. (TANKCO), a Kuwaiti company engaged in the business of petroleum equipment, oil services and instrumentation, is bringing new products to the Middle East.

Mobile fire fighting support vehicles

AT INTERSEC 2016, TANKCO will unveil the LUF 120 and LUF 60 remote-controlled fire fighting support machines for the Middle East market. The LUF family of remotely operated fire fighting support machines are designed to be sent in advance of fire fighters to clear a safe path for them. Designed with different features and capabilities, these highly flexible and easy-to-handle mobile machines are manufactured in Austria by LUF, which is part of the Bruno Walters group.

A strong machine for strong fires

The LUF 120™ is one of its kind in the region and is a leader in fire fighting procedures. This machine has been built to cope with large fires, with an extinguishing capacity up to 12,000 litres water per minute through the main monitor. This machine is motorised with a 450 HP V6 diesel engine. The two pump units inside the machine are hydraulic driven to throw the water out of the main monitor in the direction of the seat of the fire. The radio remote-controlled LUF 120™ operates even in the most challenging of fires, for example refinery fires.

The 350° rotating and +20° till +80° vertical adjustable main monitor enables the operation units to get the situation under control, so the rescue teams can follow safely right up to the seat of fire. High mobility as well as flexibility are guaranteed by a crawler track system which is easily capable of "bulldozing" a moveable barrier out of the way.

Despite the solid construction, all components are accessible and maintenance-friendly. The construction of the machine allows operations at extreme heat and low oxygen of the ambient air.

The LUF 60™ wireless remote controlled mobile fire fighting supporting machine clears the path for advancement up to a distance of 300 m by incorporating a high capacity positive pressure ventilator and a "water beam" fog. This combination clears away smoke, heat, toxic gases and reduces the intensity of the fire, allowing fire fighters and rescue teams to follow safely. State-of-the-art control elements ensure easy handling and high precision operation.

At a fire test in an Austrian tunnel, the temperature beneath the tunnel's ceiling was lowered from more than 1,000°C to 150°C within around five minutes by using the LUF60, says the company.

The diesel-powered LUF 60™ is a rugged machine that can withstand the rigours of severe operating conditions and confined spaces. High mobility as well as flexibility are provided by a crawler track system, which enables it to go up and down stairways as steep as 30°, while it is capable of 'bulldozing' a normal family car out of the way.

State-of-the-art control elements enable easy handling and high precision operation. The radio-controlled unit has additional back-up manual controls in the event of a power supply failure.



The LUF 120™ in action

Applications in a variety of situations include road, rail and subway tunnels, aircraft hangers, chemical, industrial and power plants, warehouses and commercial buildings.

Meanwhile, the newly developed LUF-Mobil can easily break down barriers in traffic as well as in nature, as it can move through snow and forests.

ARGO all-terrain 8-wheel drive amphibious vehicle

The ARGO all-terrain 8x8 XTD is an 8-wheel drive amphibious off-road vehicle designed for demanding commercial uses. It benefits from large payload capacity, a tubular steel frame, sealed axles and comfort for staff.

Its low operational weight, coupled with efficient ADMIRAL steering transmission, makes this the ideal vehicle to transport people and equipment through the harshest terrain, says the company. With integrated frame mounting locations and universal mounting accessory, adding tools or equipment to the rear of the vehicle is convenient, simple and quick. Adding rubber tracks makes this the best-in-class vehicle when the task is off the beaten path, adds the company. It is available in tracked or non-tracked configurations.

This vehicle is powered by a 1028 cc liquid-cooled, three cylinder Kohler Lombardini naturally aspirated diesel engine. The engine provides 24 hp and 36.9 lbs ft of torque to the ADMIRAL two-speed transmission. It has a load capacity of up to 608 kg on land or 381 kg on water. It can transport up to four passengers on land and two on water and features a towing capacity of 907 kg.

These vehicles, along with the ARGO's big brother, the CENTAUR, are manufactured by Ontario Drive & Gear Limited (ODG), Canada, a world leader in amphibious vehicles. ■

World Future Energy Summit

Date: 18-21 January 2016
Venue: ADNEC, Abu Dhabi

WORLD FUTURE ENERGY SUMMIT

PART OF ABU DHABI SUSTAINABILITY WEEK 2016

Putting the spotlight on
renewable energy

The packed exhibition floor at the 2015 event

The leading global event dedicated to advancing future energy, energy efficiency, and clean technology, returns to Abu Dhabi in January 2016.

THE UPCOMING EVENT is particularly timely given the climate pledges submitted in advance of the critical COP21 climate summit in Paris, in which commitments on renewables and energy efficiency featured strongly. With the cost of deploying renewable energies plummeting, renewables are set to become the leading source of new energy supply globally from now to 2040, according to the International Energy Agency (IEA).

Meeting all stated renewable energy targets in GCC countries would save 4 billion barrels of oil and reduce emissions by 1.2 gigatonnes between now and 2030, according to figures revealed by the Abu

Dhabi-based International Renewable Energy Agency (IRENA) ahead of the summit.

The figures equate to 25 per cent less annual fossil fuel consumption in the power and water sector in 2030, and an 8 per cent overall reduction in per capita carbon footprint over the next 15 years. Nearly three-quarters, 74 per cent, of the

anticipated 69 gigawatts of renewable energy produced in the GCC will be generated in Saudi Arabia.

The numbers will be published in an upcoming *GCC Renewable Energy Market Analysis* slated for release at WFES 2016, where global industry leaders, decision-makers, business innovators, and investors

“ Meeting stated renewable energy targets in the GCC would save 4 billion barrels of oil between now and 2030 ”



Source: IRENA

will be coming together to seek the increasing market opportunities brought on by the region's continuous investments in renewable energy.

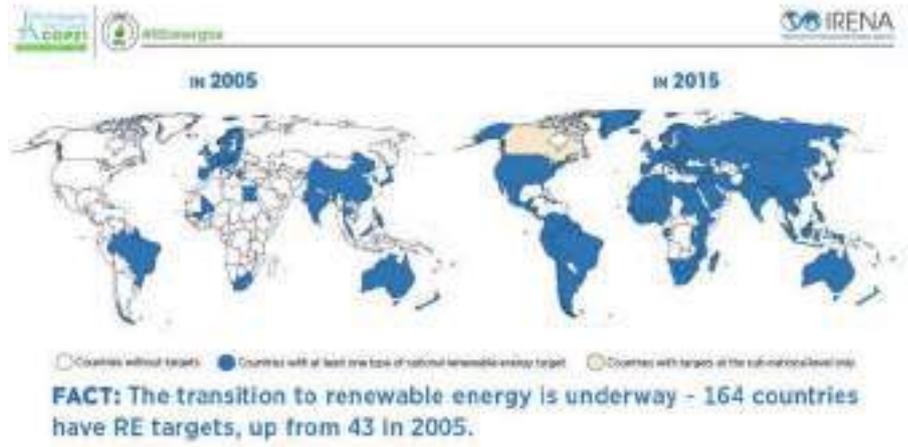
For policymakers, an important driver behind this anticipated regional shift to renewable energy includes the socioeconomic benefits it will produce. The IRENA figures also show that because renewables, in particular solar photovoltaics, can be less water-intensive than fossil fuel technologies, reaching targets would reduce consumption by 18 trillion litres, or 20 per cent, of water annually, and create roughly 130,000 direct jobs per year from now until 2030.

Part of Abu Dhabi Sustainability Week and hosted by Masdar, WFES is an annual platform where the best and brightest minds come together to exchange ideas, explore the latest developments, and address challenges in the future energy arena. The event, which is held at the Abu Dhabi National Exhibition Centre from 18-21 January, is expected to attract more than 30,000 attendees from 170 countries, and 650 exhibiting companies from more than 40 countries.

“There are more than 4,000MW in renewable energy projects currently under development in Egypt”

“The global energy system accounts for some two-thirds of greenhouse gas emissions today. Transitioning rapidly to a global system fuelled by renewable energy is the single most effective way to decarbonize the global economy and keep global temperature rise to 2 degrees Celsius, but the pace and scale of change needs to increase,” said IRENA Director-General Adnan Z. Amin. “Important gatherings like the World Future Energy Summit provide critical platforms for the knowledge-exchange needed today to advance renewable energy in the region and around the world.”

The WFES conference agenda will bring some of the world's most influential energy leaders to the stage, including ministers, regulators, top-level industry professionals, and chief economists, who will discuss impending issues in the renewable energy sector. Topics covered will range from addressing challenges faced by the region's utility providers, and innovative approaches to financing renewable projects, to trends that will shape the industry over the next two decades.



Source: IRENA

Focus on Egypt

This year's event will include a special focus on Egypt, with the inclusion of an Egypt Energy Forum.

As Egypt's installed power capacity is set to nearly double from 31 gigawatts in 2013 to 60 gigawatts in 2020, renewables will play a key role and present an opportunity of US\$13bn in investment and development, according to Frost & Sullivan. Egypt plans to reach 20 per cent of its total power from renewables by 2020, across wind, photovoltaic, concentrated solar power, and hydroelectric projects, according to a report by the Regional Center for Renewable Energy and Energy Efficiency.

“There are more than 4,000MW in renewable energy projects currently under development in Egypt, split between wind, and solar, procured under a newly established Feed-in-Tariff regime and competitive tenders,” said Bakr Abdel-Wahab, managing director of Infrastructure Private Equity at EFG Hermes.

Among the key issues to be discussed at the Forum are practical measures envisaged to accelerate renewable energy adoption across the country, including a proposed feed-in-tariff programme, and the rollout of solar rooftops. There will also be discussion around the status of key public-private-partnership (PPP) programmes, and how they will be accelerated in 2016, such as the New Cairo Wastewater Treatment Plan, the Helwan Wastewater Treatment Plan, Recycling Solid Waste project, and Sharm El Sheikh sea desalination plant. Finally, developers, operators, manufacturers, and contractors will hear from experts in the finance sector about its appetite for Egyptian project finance.

The 2016 running of the event will also see the launch of 'WFES Solar Expo', a dedicated area on the show floor for showcasing solar technology and innovation, helping governments to meet ambitious targets for renewable energy and bringing

together experts, innovators, suppliers and buyers.

Meeting the growing demand for fuel efficient vehicles in the region, and supporting the UAE's sustainability agendas with UAE Vision 2021 and Abu Dhabi Vision 2030, WFES 2016 will also launch Sustainable Transport, a zone where manufacturers and innovators will showcase sustainable transportation technology across land, sea, and air.

Confirmed speakers for WFES 2016 include H.E. Eng. Suhail Mohamed Faraj Al Mazrouei, the UAE Minister of Energy, HE Dr. Abdul Hussain Bin Ali Mirza, the Bahrain Minister of Energy, Dr Ahmad Belhouli, Chief Executive Officer of Masdar, as well as other senior representatives from Siemens, Shell, First Solar and Saudi Aramco.

Sustainability Business Connect, a tailored networking programme designed to bring buyers and sellers together, will be back again in 2016, enabling new business to flow smoothly and successfully across WFES and its partner events. In the last running of the event, more than 1,800 meetings were organised, with strong representation from key government ministries and authorities from across the MENA region.

Looking specifically at how water and waste can be used as renewable sources of energy, the International Water Summit (IWS) and EcoWaste will be co-located with WFES. A unique global platform for promoting water sustainability and efficiency, IWS will bring together world leaders, field experts, academia luminaries, and business innovators to accelerate the development of new sustainable strategies and technologies.

Held in partnership with Tadweer, EcoWaste will address the region's urgent waste disposal challenges and needs in the quest for sustainable development and environmental protection. ■



Middle East & North Africa

The Baker Hughes Rig Count tracks industry-wide rigs engaged in drilling and related operations, which include drilling, logging, cementing, coring, well testing, waiting on weather, running casing and blowout preventer (BOP) testing.

Country	THIS MONTH			VARIANCE From Last Month	LAST MONTH			LAST YEAR			
	Land	OffShore	Total		Land	OffShore	Total	Land	OffShore	Total	
Middle East											
ABU DHABI	26	26	52	12	24	16	40	25	11	36	
DUBAI	0	2	2	0	0	2	2	0	2	2	
IRAQ	51	0	51	2	49	0	49	61	0	61	
JORDAN	0	0	0	0	0	0	0	0	0	0	
KUWAIT	43	0	43	0	43	0	43	45	0	45	
OMAN	72	0	72	6	66	0	66	57	0	57	
PAKISTAN	21	0	21	-6	27	0	27	19	0	19	
QATAR	2	3	5	-1	2	4	6	2	7	9	
SAUDI ARABIA	110	17	127	2	106	19	125	97	18	115	
SUDAN	0	0	0	0	0	0	0	0	0	0	
SYRIA	0	0	0	0	0	0	0	0	0	0	
YEMEN	1	0	0	1	0	0	0	3	0	3	
TOTAL	326	48	358	16	317	41	358	309	38	347	

North Africa

ALGERIA	48	0	48	-3	51	0	51	49	0	49
EGYPT	34	11	45	7	32	6	38	46	16	52
LIBYA	0	1	1	0	0	1	1	4	3	7
TUNISIA	0	1	0	1	0	1	1	0	3	3
TOTAL	82	13	95	5	83	7	91	102	9	111

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Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS, SAUDI ARABIA

Project	City	Facility	Budget (\$ US)	Status
Arabian Amines Company (AAC) - Morpholine and Diglycolamine (DGA) Plant - Project OPAL	Jubail	DGA	300,000,000	EPC ITB
Farabi Petrochemicals Company - Yanbu Petrochemicals Plant	Yanbu	Linear Alkyl Benzene (LAB)	700,000,000	FEED
IJubail Chemicals Storage & Services Company - Petrochemicals Quay 2 (PCQ 2)	Jubail	Petrochemical Plant	450,000,000	Construction
Jubail Chemicals Storage and Services Company (JCSSC) - Storage, Handling & Shipping Terminal at King Fahd Industrial Port	Jubail	Marine Terminal	400,000,000	Construction
Kemys Elastomer Plant - Ethylene Propylene Diene Monomer (EPDM) Plant	Jubail	Ethylene	600,000,000	Construction
Kemys Elastomer Plant - Halobutyl Rubber Plant (HRP)	Jubail	Petrochemical Plant	600,000,000	Construction
Kemys Elastomer Plant - Methyl Tertiary Butyl Ether (MTBE) Plant	Jubail	MTBE	1,000,000,000	Construction
Kemys Elastomer Plant - Offsites and Utilities	Jubail	Offsites & Utilities	500,000,000	Construction
Kemys Elastomer Plant - Polybutadiene Rubber (PBR) Plant	Jubail	Petrochemical Plant	3,400,000,000	Construction
Kuwait Gulf Oil Company (KGOCC) - Gas and Condensate Export System	Khafji	Condensate Refinery	2,000,000,000	Construction
Lubref - Lubricants Refinery Expansion	Yanbu	Lube Oil	1,000,000,000	Construction
Maaden - Sabic - Mosaic - Waad Al Shamaal Mining City/Phosphate City (Package 1) - Ammonia Plant	Ras Al Khair	Petrochemical Plant	850,000,000	Construction
Maaden - Sabic - Mosaic - Waad Al Shamaal Mining City/Phosphate City (Package 2) - DAP / NPK / BOP	Ras Al Khair	Petrochemical Plant	750,000,000	Construction
Maaden - Sabic - Mosaic - Waad Al Shamaal Mining City/Phosphate City - (Package 5) - Balance Downstream Plant	Ras Al Khair	Petrochemical Plant	500,000,000	EPC ITB
Maaden - Sabic - Mosaic - Waad Al Shamaal Mining City/Phosphate City - Sulphuric Acid Plant & Power Plant	Ras Al Khair	Sulphuric Acid	1,500,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 (Overview)	Rabigh	Aromatics	5,000,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - Clean Fuel Package	Rabigh	Sulphuric Acid	1,000,000,000	EPC ITB
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - MTBE Plant	Rabigh	MTBE	500,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - Tank Farm Package (UO2) & Common Facilities (UO3)	Rabigh	Refinery	500,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - Utilities and Offsites (UO1)	Rabigh	Offsites & Utilities	5,000,000,000	Construction
Sabic - Celanese Corporation - National Methanol Company (Ibn Sina) - Polyacetal Plant Factory	Jubail	Offsites & Utilities	400,000,000	Construction
Sabic - Debottlenecking and Expansion of Petrokemys Butadiene Extraction Plant	Jubail	Butadiene	500,000,000	FEED
Sabic - ExxonMobil Chemical Company - Kemys - Yanpet - Synthetic Rubber Plant	Jubail	Butadiene	5,000,000,000	Construction
Sabic - Mitsubishi Rayon - Lucite International - Alpha 2 - Petrochemical (MMA & PMMA) Plants	Jubail	Dimethyl Ether (DME)	5,000,000,000	Construction
SABIC - Petrokemys - Acrylonitrile Butadiene Styrene (ABS) Plant	Jubail	Styrene	561,000,000	Construction
Sadara Chemical Company - Jubail Integrated Refining & Petrochemicals Project (Overview)	Jubail	Refinery	20,000,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Acrylic Acid Monomers Complex & Plastics Plant	Jubail	Acrylic Monomers	1,700,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Aniline Formalin and Dinitrobenzene (DNT) Nitric Facilities Package	Jubail	Formaldehyde	500,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Ethylene Oxide Derivatives (EOD) Unit	Jubail	Ethylene Oxide	350,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Ethylene Oxide Plant	Jubail	Ethylene Oxide	600,000,000	Construction

Project	City	Facility	Budget (\$US)	Status
Sadara Chemical Company - Jubail Petrochemicals Complex - High Pressure Low Density Polyethylene (HP-LDPE) Plant	Jubail	Low Density Polyethylene (LDPE)	400,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Methyl-N-nitrosobenzamide (MNB) Package	Jubail	Petrochemical Plant	500,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Offsites & Utilities	Jubail	Offsites & Utilities	1,650,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Polyethylene Oxide Diacrylate (POD) Plant	Jubail	Polyethylene	300,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Polyethylene Package	Jubail	Polyethylene	1,300,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Polymeric Methylene Diphenyl Disocyanate (PMD) Facility	Jubail	Polyolefins	500,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Propylene Oxide (PO) Facility	Jubail	Propylene	500,000,000	Construction
Sadara Chemical Company - Jubail Petrochemicals Complex - Toluene Di-Isocyanate (TDI) Production Facility	Jubail	Toluene Di-Isocyanate	1,000,000,000	Construction
SAMREF - Yanbu Oil Refinery Revamp - Clean Fuels Project (Overview)	Yanbu	Refinery	2,000,000,000	Construction
Saudi Aramco - Arabiyah and Hasbah Gas Field Development (Overview)	Arabiyah	Gas Field	3,000,000,000	Construction
Saudi Aramco - Bapco - AB Pipeline	Various	Oil	350,000,000	EPC ITB
Saudi Aramco - Dow - Ras Tanura Gas Plant (Overview)	Ras Tanura	Gas Field	4,000,000,000	EPC ITB
Saudi Aramco - Duba-1 Gas field	Red Sea	Gas Field	25,000,000,000	Feasibility Study
Saudi Aramco - Fadhili Gas Plant (Overview)	Eastern Region	Gas Field	5,000,000,000	E&P
Saudi Aramco - Fadhili Gas Plant - Main Processing Facilities (Package 1)	Eastern Region	Gas Treatment Plant	2,000,000,000	E&P
Saudi Aramco - Fadhili Gas Plant - Offsites & Utilities (Package 3)	Eastern Region		1,000,000,000	E&P
Saudi Aramco - Fadhili Gas Plant - Sulphur Recovery Unit SRU (Package 2)	Eastern Region	Gas Treatment Plant	2,000,000,000	E&P
Saudi Aramco - Hail Bulk Plant	Hail	Bulk Storage Plant	400,000,000	Feasibility Study
Saudi Aramco - Jizan Export Refinery (Overview)	Jizan	Refinery	7,000,000,000	E&P
Saudi Aramco - Jizan Export Refinery - Crude Distillation Unit/Vacuum Distillation Unit, Flare & Pipe Rack Complex	Jizan	Refinery	500,000,000	E&P
Saudi Aramco - Jizan Export Refinery - Marine Terminal Facilities	Jizan	Marine Terminal	500,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Naphtha Hydrotreater Complex	Jizan	Hydrotreating	500,000,000	E&P
Saudi Aramco - Jizan Export Refinery - Sour Water Stripper & Amine Regeneration Unit	Jizan	Refinery	500,000,000	E&P
Saudi Aramco - Jizan Export Refinery - Tank Farms	Jizan	Oil Storage Tanks	1,000,000,000	E&P
Saudi Aramco - Jizan Export Refinery - Utilities Package	Jizan	Offsites & Utilities	1,000,000,000	E&P
Saudi Aramco - Liquefied Natural Gas (LNG) Receiving Terminal	Jeddah	Liquefied Natural Gas (LNG)	1,000,000,000	Feasibility Study
Saudi Aramco - Maintain Potential Programme (MPP) (Overview)	Red Sea	Oil Field	500,000,000	E&P
Saudi Aramco - Master Gas System Expansion (MGSE) (Overview)	Various	Natural Gas Liquefaction (NGL)	4,050,000,000	Construction
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase II - Package 1 - Western Region Pipeline	Western Region	Gas	827,000,000	EPC ITB
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase II - Package 3 - Eastern Region Pipeline	Eastern Region	Gas	372,000,000	EPC ITB
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase II - Package 4 - East West Pipeline 1 Upgrade	Qassim	Gas	60,000,000	EPC ITB
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase II - Package 2 - Central Region Pipeline	Central Region	Gas	364,000,000	EPC ITB
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase I	Various	Gas Pipeline	1,650,000,000	Construction
Saudi Aramco - Master Gas System Expansion (MGSE) Phase II - Booster Compressor Stations	Dammam	Compressor Station	800,000,000	EPC ITB
Saudi Aramco - Midyan Gas Processing Plant	Tabuk	Gas Processing	800,000,000	Construction
Saudi Aramco - Ras Tanura Refinery - Clean Fuels Package	Ras Tanura	Aromatics	5,000,000,000	EPC ITB
Saudi Aramco - Riyadh Refinery - Clean Transportation Fuel	Riyadh	Isomerisation	2,500,000,000	Construction
Saudi Aramco - Shedgum to Yanbu Natural Gas to Liquids (NGL) Pipeline	Shedgum	Liquefied Petroleum Gas (LPG) Pipeline	500,000,000	E&P
Saudi Aramco - Unconventional Gas Program - Tight Gas Production Systems A and B	Turaif	Tight Gas	3,500,000,000	E&P
SAUDI ARAMCO - Yanbu Refinery And Petrochemical Complex	Red Sea		20,000,000,000	Feasibility Study

Project Databank

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Project Focus

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Project Summary

Project Name	SAUDI ARAMCO - FADHILI GAS PLANT , EASTERN REGION
Name of Client	Saudi Aramco
Budget (\$ US)	6,500,000,000
Status	Engineering & Procurement
Project Start	Q1-2013
End Date	Q1-2021
FEED / PMC	Foster Wheeler
Main Contractor	Tecnicas Reunidas Petrofac
Contract Value (\$ US)	4,700,000,000
Award Date	Q3-2015

Project Status

Nov 2015	Saudi Aramco awards EPC contract to Petrofac, with the scope of the contract to construct six sulphur recovery trains for package 2.
Sep 2015	The client awards US\$4.7 bn plant construction contracts to Tecnicas and Petrofac, with Tecnicas signing two contracts worth US\$3 bn and Petrofac awarded \$1.7 bn contract.

Project Schedules

Feasibility Study	1Q-2013
FEED ITB	2Q-2013
FEED	3Q-2013
EPC ITB	4Q-2014

Engineering & Procurement	4Q-2015
Construction	2Q-2016
Completed	1Q-2021

Project Scope

Saudi Aramco has ramped up its offshore non-associated gas operations in the Gulf in recent years and is developing several fields in the region. The Kingdom is targeting natural gas production of 15bn cubic feet per day (cfd) by 2018. This gas is required to replace the crude oil in the electric power generation, to feed the mixed crackers of the future petrochemical projects and to support the enhanced oil recovery (EOR) programme of the maturing crude oil fields.

Saudi Aramco plans to build a new gas plant at the Fadhili oilfield to process sour gas from the Khursaniyah oilfield and Hasbah non-associated gas field, with a processing capacity of 2.5 bn cfd. The scope of the scheme will include the construction of a hydro-treater and hydrogen plant, gas sweetening facilities, a pipeline network, storage facilities, natural gas liquids recovery, gas dehydration facilities, as well as offsite and utilities.

Additional scope of works include the following:

- Raw gas inlet and processing facilities
- Natural gas liquids (NGL) fractionation unit
- Sulphur recovery unit
- Dedicated co-generation power plant
- Industrial support facilities
- Fadhili downstream pipelines
- Residential camp
- Associated facilities

The co-generation plants will be located at Abqaiq, Ras Tanura and Hawiya, and will produce a total of 1,500 tonnes an hour of steam. The projects are scheduled to come online in 2016. The consortium will build and operate the cogeneration facilities for 20 years, providing power and steam to all three facilities. The new co-generation power plant will provide power for the gas plant, as well as supply the kingdom's national grid. Although Aramco is the client, it is believed that Saudi Electricity Company

(SEC) could also take a share of the facility.

The scheme is split into three packages, each worth US\$2bn:

- Package 1: Main Processing Facilities
- Package 2: Sulphur Recovery Unit (SRU)
- Package 3: Offsites and Utilities

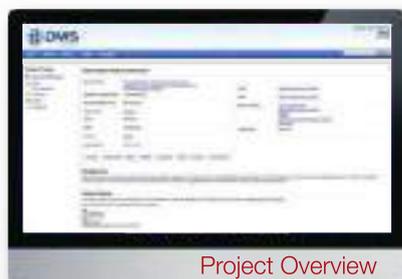
Fadhili Gas plant Pipeline package:

- 260km sales gas pipeline from Fadhili gas plant to East-West Pump Station No. 1
- 40km sales gas pipeline from Khursaniyah-Berri gas and Wasit-Berri gas pipelines to Fadhili gas plant
- 40km pipeline to transport heavy diesel oil from Fadhili gas plant to the Wasit gas plant
- 40km pipeline to transport sour gas from Wasit gas plant to Fadhili gas plant
- 61km pipeline to transport sweet water from Marfiq Jubail to Fadhili gas plant
- Associated facilities

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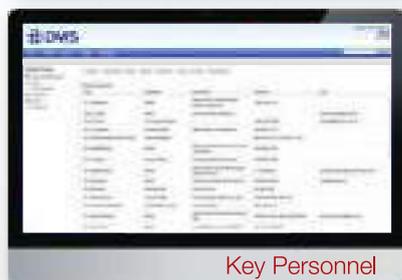
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Project Overview



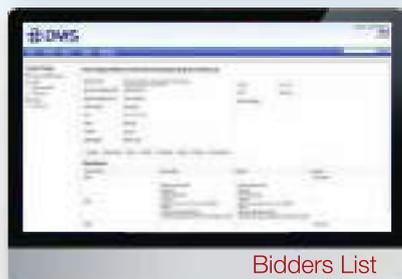
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Key Personnel



Market Forecast



Bidders List



Industry News



The DNA for Success

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- Compare Contractor Workloads Against Each Other
- 65 Levels of Key Personnel
- Deeper Project Financing Data

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أوبيتو بجد على وضع خطة مرحلية لتزويد الحكومة العمانية بحل مستدام لاحتياجات توظيف مستخدميها، ووفقاً لطلبات الصناعة. المرحلة الأولى عبارة عن تحليل للإمداد الحالي للتدريب المهني وغير المهني في جميع أنحاء عمان. ستقوم شركة أوبيتو بزيارة مراكز التدريب والكلية لتحديد معيار التدريب اللازم، ثم تقدم بعد ذلك التوصيات بشأن كيفية إمكانية تحسين تقديم التدريب الفني لتقديم إطار عمل للمؤهلات التي ستلبي الطلبات الحالية والمستقبلية من ذوي المهارات، وتحسين الكفاءة في عمليات التشغيل وأنشطة الصيانة المرتبطة باستخلاص الهيدروكربون.

ومن خلال العمل مع الحكومة وأصحاب العمل، سنساعد عمان في تطوير بنية تحتية للتعليم بالدولة من أجل توفير كوادر مؤهلة لهذا القطاع، ومعتزف بها في هذا المجال، ومدعومة بمعايير التدريب الفني، والمعايير المهنية، وعملية تقييم قوية وتوثيق ومؤهلات معتمدة. وهذا سيضمن تقديم التدريب بالطريقة الصحيحة من خلال الأشخاص المناسبين باستخدام المعدات المناسبة في بيئة آمنة ومدارة جيداً، بما يمكن من إدارة الكفاءة على نحو فعال.

ونتيجة لعمل شركة أوبيتو الاستكشافية في عمان، سيكون بإمكان المئات من العمانيين الحصول على التدريب وفقاً للمؤهلات المعترف بها في هذا القطاع في الصيانة الكهربائية والميكانيكية والآلات والضوابط بما يتيح لهم العمل في مجال صناعة النفط والغاز. وهذا يخلق فرصاً اقتصادية جديدة للعمانيين، وهو ما يؤثر على نحو إيجابي على الاقتصاد، ويمنح صناعة النفط الثقة في كفاءة فنييها.

وباعتبارها مؤسسة لا تهدف إلى الربح مملوكة للصناعة، فإن شركة أوبيتو ستستثمر العائدات المحققة من هذا العمل، مرة أخرى، في التطوير المستمر للمنتجات التعليمية والخدمات، بما يحقق مصلحة الشرق الأوسط ومجال الصناعة الأوسع نطاقاً.

وتوجيه الشكر لها للاستثمار في الوقت والموارد المالية في تسليمها والذي سيعمل، في نهاية الأمر، على إنقاذ الأرواح. ونحن على ثقة من أن أصحاب العمل الرئيسيين الآخرين العاملين في قطاع النفط والغاز بالعراق سوف يحتذون حذو شركة شل، ويلتزمون بتدريب العاملين لديهم على هذا المعيار.

وتمثل هذه المبادرة إقراراً بدور شركة أوبيتو في التأثير على معايير السلامة العالمية الشائعة وصياغتها. ولكن الأهم من ذلك هو الحافز وراء تطوير بنية تحتية للتعليم للشعب العراقي والذي - إذا كانوا عازمين على إعادة بناء بلدتهم بنجاح - يجب أن يخلق قطاع نفط وغاز آمناً ومستداماً ومربحاً.

بناء قوة عاملة وطنية

تسعى الحكومة، وأصحاب العمل أيضاً، في عُمان إلى تحسين عملية تقديم التدريب الذي سيؤدي إلى وجود قوة عاملة ماهرة وآمنة في قطاع النفط والغاز، وتسهم بصورة إيجابية في اقتصاد الدولة. وبفضل امتلاكها سجلاً حافلاً في مساعدة الدول المنتجة للنفط والغاز في بناء قوى عاملة وطنية لاستغلال احتياطياتها، تعمل شركة

غاز الحامض، في حقول إنتاج النفط والغاز التي بها محتوى عالٍ من هذا الغاز في خزاناتها، وهو يعد أحد أكبر مخاطر الإنتاج في العراق.

ويعد هذا أول برنامج تدريب رائد في مجال الصناعة يتم نشره في العراق منذ توقيع شركة أوبيتو على اتفاقية مع وزارة النفط للمساعدة في تطوير القوة العاملة المحلية بالدولة، وتزويدها بالمهارات والتدريب اللازم لاستخدام موارد الهيدروكربون بأمان، وتوفير المؤهلات المطلوبة لحصول العراقيين على الوظائف في قطاع الطاقة بالدولة.

وباعتبارها إحدى أكبر الشركات العالمية في العراق، فقد استثمرت شل في مركز تدريب جديد في منطقة مجنون (بالقرب من البصرة) وعملت عن كثب مع شركة أوبيتو لتخصيص معيار التدريب المتعلق بكبريتيد الهيدروجين للقوة العاملة العراقية. علماً بأن مركز تدريب شل في منطقة مجنون قائم الآن ويعمل ويعتبر المركز الأول المعتمد من شركة أوبيتو في العراق. وتعد هذه خطوة رئيسية في رحلتنا نحو بناء قوة عاملة عراقية آمنة معتمدة وفقاً للمعايير الدولية.

وقد أظهرت شركة شل قيادة حقيقية في تطوير معيار التدريب هذا ونشره، ويجب الاعتراف بها



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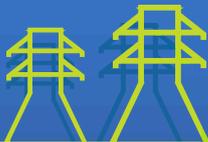


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منهج تدريب قائم على المعايير من خلال هيئة المهارات ومعايير التدريب بشركة أوبيتو، يمكن للشركات ضمان تمتع القوة العاملة بالمهارات المناسبة، والعمل بأمان، ومن ثم فإنها تكون أثر كفاءة.

الطلب المتزايد على معايير أوبيتو

يحتفظ سوق النفط والغاز، في منطقة الشرق الأوسط، بوضعية أفضل مما هو في المجالات الأخرى حول العالم. وتشهد شركة أوبيتو بعض الترشيح الحتمي في المنطقة نتيجة للانكماش في عدد العاملين الذين يجري تدريبهم. وهذا أمر متوقع حيث إن السوق يصحح نفسه. فقلة النشاط تؤدي إلى الحاجة إلى عدد عمالة أقل وبالتالي احتياج أقل للتدريب. ولكن بما أن المنطقة تتضح، يقتضي هذا حدوث تطور أكبر، وهو ما يستدعي وجود ديناميكيات شيقة جدا في السوق.

تتمثل إحدى هذه الديناميكيات في الطلب المتزايد على معايير أوبيتو. فمزودو التدريب في منطقة الشرق الأوسط يسعون إلى النمو والتطور، ويتطلعون إلى زيادة ما يقدمونه من خلال الانتقال من التدريب الأساسي على البقاء والسلامة، إلى تدريب فني أكثر تخصصا. نحن نشهد زيادة في منح شهادات الاعتماد والموافقات لعمليات الحفر والرفع وإدارة التركيبات في حقول النفط البحرية، والتدريب على مكافحة الحرائق. ومن ثم يرغب مزودو التدريب في المنطقة في الاستئثار بحصة أكبر من هذه السوق المنكمشة، وتعد أفضل طريقة للقيام بذلك هي الحصول على الاعتماد والموافقة من شركة أوبيتو. وبالمثل، ينشد أصحاب العمل الأذكى والحكومات منهج التدريب القائم على المعايير لتحسين المهارات والكفاءة.

وخير مثال على ذلك هو عملنا في العراق مع شركة شل لضمان تدريب 15 ألف عامل عراقي في قطاع النفط والغاز وفقا لمعيار مُعترف به عالميا في التعامل بأمان مع المخاطر المحتملة لكبريتيد الهيدروجين (S2H). وينتج غاز كبريتيد الهيدروجين الأكل والخطر والمعروف أيضا باسم



ديفيد دويج، الرئيس التنفيذي لمجموعة أوبيتو العالمية

منهج تدريب قائم على المعايير

في هذا المقال، يقول ديفيد دويج، الرئيس التنفيذي لمجموعة أوبيتو العالمية، إن وجود قوة عاملة ماهرة وأمنة يمثل عنصراً رئيسياً للعمل بكفاءة والبقاء تنافسياً في المناخ الحالي.

لهذا يجب تطبيق استراتيجية قوية للعمال، في حالة حدوث انكماش، من أجل الحفاظ على سلامة القوة العاملة، وضمان وجود المُشغل في مكانه المناسب، وتمتعه بميزة غالبية على المنافسين للاستفادة من التحسن والارتفاع عند وصوله، كما سيحدث بلاشك بالنظر إلى تاريخ القطاع.

والمؤسسات الذكية هي التي تدرك أنه في أوقات تخفيض التكلفة، والسعي لزيادة الكفاءة، يعد موظفونا العامل الأساسي لنجاحنا. حيث يضمن وجود قوة عاملة عالية المهارة محفزة وأمنة بقاء الصناعة تنافسية. وحتى في ظل المناخ الحالي، سوف تتواصل عمليات الإنتاج، كما ستظل هناك حاجة إلى الصيانة. وبنظرة ساخرة إلى أنه سيتم تخفيض أنشطة الصيانة، نجد أنه حينئذ ستزداد الحاجة إلى ضمان وجود قوة عاملة مُدربة وتتمتع بالكفاءة.

إن فعل الكثير باستخدام القليل من الموارد سيكون الطريق للمستقبل لبضع سنوات. وباتباع

يشعر الجميع بانعكاسات الانهيار الحاد في أسعار النفط على الصعيد العالمي، غير أنه في هذه الحقبة الجديدة، التي يسيطر عليها تخفيض التكاليف وزيادة الكفاءة، يجب أن يضمن هذا القطاع الحفاظ على سلامة العاملين به والاستمرار في تطوير مهارات القوة العاملة. ففي أوقات انخفاض التكلفة الأكثر تكرارا للأسف، وبصورة خاطئة، تمثل ميزانيات التدريب والتطوير أهدافا رئيسية لتخفيض الموازنة. لكن التخفيضات الشاملة الكاسحة في هذه المجالات غالبا ما تنشأ عن الجهل بالضرر الحقيقي الذي تسببه، وتعمل فقط كتدابير قصيرة المدى. ويظهر التاريخ أن التكلفة الحقيقية للتخفيضات في التدريب تعاود الظهور مجددا في وقت لاحق في شكل حالات نقص في المهارات وتضخم في الأجور. وتظل الأخطار والمجازفة هي نفسها، بغض النظر عن أسعار النفط. ويجب ألا يعني انخفاض سعر النفط أنه يتم التعامل معها بصورة مختلفة.

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بتروجيت تفوز بعقد في عُمان

منحت شركة الغاز العمانية شركة بتروجيت بمصر مشروع خط غاز صلالة. ويمثل المشروع مبادرة تهدف إلى تعزيز إمداد الغاز الطبيعي من محافظة ظفار. حيث إنه يستتبع إنشاء خط أنابيب قطره ٢٢ بوصة يبدأ في محطة ضاغطات الغاز التابعة لشركة الغاز العمانية في نمر. وسوف يرتبط خط الأنابيب، البالغ طوله ٨٥ كم، بخط أنابيب قائم في مرمول يمتد بالكامل حتى

محافظة ظفار. ومن المتوقع أن تتعهد شركة بتروجيت بعقد أعمال التصميم والشراء والتشيد (EPC) لمشروع الخط الحلقي بناء على تصميم هندسي تأسيسي متكامل (FEED) مُقدم من شركة الغاز العمانية وتدعمه شركة تبودين بعمان. ومن المنتظر أن يبدأ التشييد بحلول فبراير/شباط ٢٠١٦، في حين أنه قد جرى بالفعل شراء الأنابيب للمشروع من شركة الغاز العمانية بموجب مناقصة منفصلة، وهو ما أكده مسؤولو شركة بتروجيت.



خط الأنابيب طوله ٨٥ كم

«ثري إم» تفتتح مركزاً لخدمة العملاء في الدمام



أسامة حمودة، العضو المنتدب لـ «ثري إم، السعودية

تقوم في الوقت الحالي شركة ثري إم بافتتاح مركز خدمة لعملائها في الدمام بالمملكة العربية السعودية. هذا المركز سيخصص لخدمة قطاع النفط والغاز، وسيشارك المعرفة وأفضل الممارسات العالمية مع أصحاب المصلحة الأساسيين بقطاع النفط والغاز بالدولة، ومساعدتهم على تحقيق الأهداف التشغيلية وخطط التنمية. وقد صرح العضو المنتدب لشركة ثري إم المملكة العربية السعودية، أسامة حمودة قائلاً: «يعد قطاع النفط والغاز مجال اهتمام أساسياً لشركة ثري إم في المملكة العربية السعودية. وباعتبارها شركة تعتمد على العلوم، فإننا نمتلك أكثر من ١٠ آلاف منتج يستخدم في جميع مجالات هذا القطاع. ونحن جميعاً نعلم أن قطاع النفط والغاز يواجه حالياً أوقاتاً عصيبة، لكننا نعتقد أيضاً أن الحلول التي نقدمها يمكن أن تساعد الفاعلين في القطاع في العمل على نحو أكثر كفاءة، وبالتالي التغلب على بعض من أصعب التحديات التي نواجهها اليوم عبر قطاعات الصناعات التحويلية والنقل وخطوط الأنابيب والتنقيب والإنتاج». وتتضمن الحلول المقدمة لقطاع النفط والغاز بالمنطقة فقايق زجاجية خفيفة

الوزن لخفض كثافة الملاط بقاع البئر، ومواد الطلاء عالية الأداء لمنع التآكل في البيئات القارصة، وحلول السلامة الشخصية والبيئية للوقاية من المخاطر الكيميائية والميكانيكية. وكذلك المواد المضافة المخصصة لمعالجة البوليمر لمكونات السيارات والمركبات الفضائية. كذلك كشف مزود الحلول النقيب عن أنه سيتم افتتاح مركز خدمة عملاء مماثل في أبوظبي بالإمارات العربية المتحدة.

ومن بين العملاء الرئيسيين، الذين سيستفيدون من إمدادات الغاز الإضافية، مطورو مشروع طاقة مستقل (IPP) قيد الإنشاء حالياً في صلالة. ويقوم حلف مكون من شركة أكوا باور وشركة مستوي أند كو لميتد وشركة ظفار الدولية للتنمية والاستثمار القابضة (DIDIC) بتأسيس محطة الطاقة النظيفة بقدرة ٤٤٥ ميغا واط في مدينة ريسوت الساحلية.



مفكرة رجال الأعمال

يناير/كانون الثاني ٢٠١٦

٢١ - ١٨ معرض الأمن والسلامة والوقاية من الحريق - إنترسك دبي
٢١ - ١٨ مؤتمر قمة طاقة المستقبل - أبوظبي

فبراير/شباط

٦ - ٣ معرض البصرة للنفط والغاز - البصرة
١٤ - ١٦ منتدى الشرق الأوسط للتكنولوجيا دبي
٢٢ - ٢٤ معرض وندوة تقدم البيئة في قطاع النفط والغاز - الدمام

مارس/آذار

٧ - ١٠ معرض ومؤتمر الشرق الأوسط لعلوم الجيولوجيا المنامة
٨ - ٩ منتدى الصناعات التحويلية السعودية - الدمام
٢١ - ٢٢ معرض ومؤتمر عُمان الدولي للنفط والغاز - OGWA مسقط

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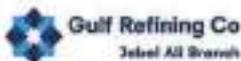
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الرئيس التنفيذي لـ(سابك): التنافسية أساس زيادة الحصة السوقية في قطاع البتروكيماويات العالمي



يوسف بن عبد الله البنيان، الرئيس التنفيذي لسابك، يلقي كلمة في منتدى جيبيكا

التجارية الكبرى مثل اتفاقية الشراكة عبر الباسيفيك؛ وتواصل المفاوضات الجارية حول اتفاقيات أخرى، فإن المنتجين الخليجين تُركوا مكشوفين للتأثر بالقرارات التي يمكن أن تتخذها التكتلات التجارية الكبرى. وقال البنيان إن مواجهة هذه التحديات ستطلب جهوداً موحدة من قبل أعضاء «جيبكا» وحكوماتهم. ولكن في الوقت الحاضر، يمكن لصناعة البتروكيماويات الخليجية أن تقوم باتخاذ خطوات لتحسين مستوى تنافسيتها بنفسها. إذ يمكن للشركات تحسين عملياتها لتصبح أكثر كفاءة. كما يمكنها زيادة الاستثمار في الابتكار والتقنيات، وتنوع منتجاتها بحيث تشمل دعم الصناعة التحويلية، الأمر الذي يولد فرصاً وظيفية أكثر من مصانع المنتجات الأساسية. وأخيراً ينبغي عليها الاستثمار في تطوير المواهب وإدارتها، من أجل تلبية متطلبات قطاع أعمال يزداد تعقيداً من الناحية التقنية وتتنامى حاجته لقوة عاملة عالية التدريب.

يمكن لهذه الخطوات وغيرها المساعدة على ضمان مواصلة قطاع البتروكيماويات الخليجي دوره كمصدر للازدهار، وتوفير الفرص الوظيفية، في منطقة تواجه مطالبات خلق فرص وظيفية لأجيال المستقبل. وقال البنيان: «تتمتع صناعة البتروكيماويات في دول مجلس التعاون الخليجي بتاريخ يدعو للفخر إضافة للعديد من الإنجازات العظيمة»، وأضاف: «يقع على عاتقنا نحن المتواجدين هنا اليوم واجباً أخلاقياً يستدعي ضمان أن يكون مستقبل الصناعة مميّزاً وريادياً بقدر ما كان عليه ماضيها».

المشهد العام للعلاقات التجارية العالمية». واعتبر البنيان أن نهضة صناعة الطاقة التي تشهدها الولايات المتحدة الأمريكية، أحد أهم التطورات التي تواجه صناعة البتروكيماويات في السنوات الأخيرة. فهذه الزيادة الكبيرة في الإنتاج تمنح أفضلية كبيرة في الأسعار لوحداث التكسير في الولايات المتحدة. لكن التحدي الأعظم. على الأرجح - الذي يواجه المنتجين في منطقة الخليج هو تغير معايير التجارة العالمية، وذلك مع استكمال الاتفاقيات

قال يوسف بن عبد الله البنيان، نائب رئيس مجلس إدارة (سابك) الرئيس التنفيذي المكلف، ونائب رئيس الاتحاد الخليجي للبتروكيماويات والكيماويات «جيبكا»، تستطيع صناعة البتروكيماويات الخليجية تنمية حصتها من الأسواق العالمية، ولكن عليها أولاً تعزيز تنافسيتها. جاء ذلك في كلمة ألقاها خلال فعاليات المنتدى السنوي العاشر لاتحاد جيبيكا، الذي عُقد يوم ١٩ نوفمبر/ تشرين الثاني في مدينة دبي. وقال البنيان: «يتطلع القطاع الصناعي للبتروكيماويات إلى مستقبل قوي عالمياً»، مضيفاً: «تتوقع (سابك) نمو الطلب على الإيثيلين بنسبة ٣ في المائة سنوياً بين الوقت الحالي والعام ٢٠٣٥». مؤكداً على أهمية التنافسية بقوله: «يمكننا في الشرق الأوسط تنمية حصتنا من تلك الأسواق، ولكن ينبغي علينا زيادة تنافسيتها».

وحول وضع الاقتصاد العالمي، قال البنيان لقادة الصناعة المجتمعين في المنتدى: «رغم أن تقلب أسواق النفط والوضع العام للاقتصاد العالمي عاملان أساسيان في التأثير على الصناعة فإن التحديات التي تواجهها هي تحديات ذات طبيعة مختلفة تتمثل في كون ميدان التنافسية في هذه الصناعة سريع التغير، وأيضاً زيادة مستويات الاكتفاء الذاتي من البتروكيماويات في عدد من الأسواق الرئيسية، وتغير



حفل توقيع مذكرة التفاهم

الشركة من جانب شركة أدنوك للتعاون في تطوير منهج جديد وفعال للاستخراج المعزز للنفط. وأنا على قناعة بأننا، مع شركة باسف الأم، نمتلك التقنيات المناسبة للمساهمة بشيء ما لتحقيق أهداف أبوظبي وغاياتها. وتتوجه مذكرة التفاهم هذه نحو المساهمة في الهدف الاستراتيجي لأبوظبي المتمثل في الوصول إلى ٧٠ في المائة من الاستخراج النهائي من حقول النفط الخاصة بها في المستقبل».

أدنوك وونترشال توقعان مذكرة تفاهم

وقعت كل من شركة بترول أبوظبي الوطنية (أدنوك) وشركة وونترشال الألمانية للتقيب والإنتاج مذكرة تفاهم بخصوص التعاون المستقبلي في مجال البحث والتطوير، مع التركيز على الاستخراج المعزز للنفط (EOR) باستخدام مواد كيميائية متخصصة لقطاع النفط والغاز. ويتمثل الهدف الرئيسي من مذكرة التفاهم هذه في تطوير حلول مخصصة بصورة مشتركة لمواجهة التحديات الكامنة تحت السطح، والتي تعد ميزة لحقول النفط المحلية - وهي درجة الحرارة المرتفعة والملوحة العالية في خزانات كربونات أبوظبي. وعقب تحقيق نتائج عملية ناجحة، ثمة تصورٌ بإجراء اختبار تجريبي في أبوظبي. فقد صرح ياسر سعيد المزروعى، نائب مدير قطاع التقيب والإنتاج بشركة بترول أبوظبي الوطنية (أدنوك) قائلاً: «مع مشروع بحث الاستخراج المعزز كيميائياً للنفط، ستعمل كل من شركة أدنوك وونترشال على وضع حلول متقدمة للتحديات الكامنة تحت السطح في أبوظبي. وإذا ما نجحنا في جهودنا، فقد نتمكن من تعزيز حقول استخراج النفط المحلي. وبهذه الطريقة نؤمن الإنتاج وإمداد الطاقة المستقبلي في أبوظبي». وقال مارتن باكامان، عضو مجلس إدارة شركة وونترشال المسؤول عن التقيب والإنتاج: «تجلب شركة وونترشال، باعتبارها شركة تابعة بالكامل لشركة باسف الكيميائية، قدرة البحث والتطوير للشركة الأم في الكيمياء إلى المشروع. وإنه لشرف كبير لنا اختيار

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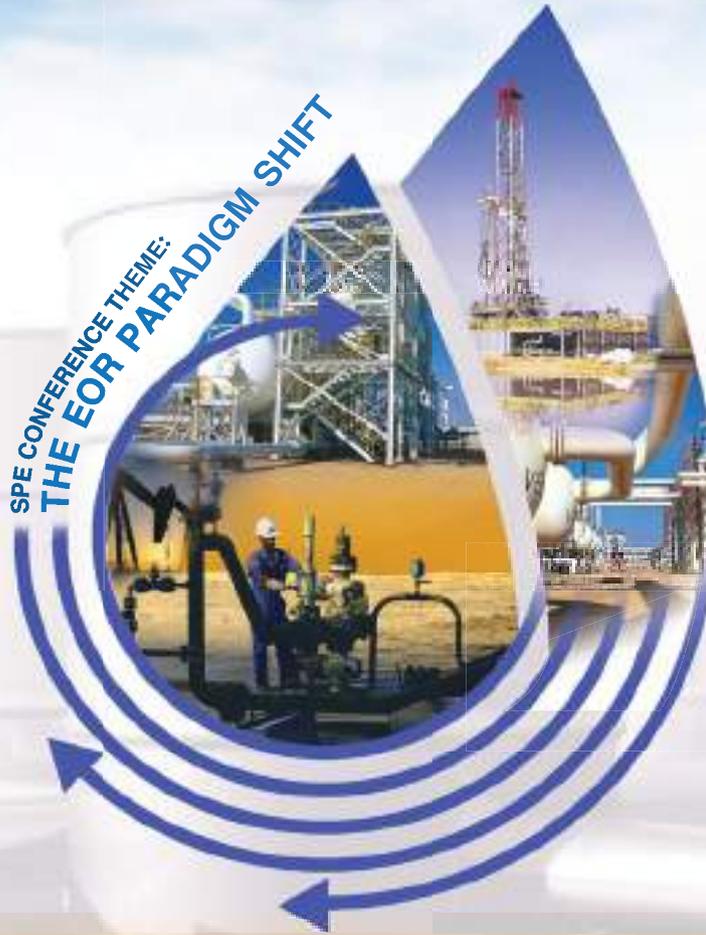
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