

Oil Review

Oil · Gas · Petrochemicals

Middle East

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**The oil market –
hard climb
ahead**

- Egypt's exploration boom
- Rig market outlook
- Setting the standard for compressor installations
- The latest in gas detection
- Balanced cement plugging techniques
- The push for decarbonisation

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→ Editor's note

AFTER A TUMULTUOUS year, can the oil and gas industry hope for better prospects in 2021? Moin Siddiqi, our resident economist, assesses the outlook for the oil market, with the two critical factors influencing the pace of recovery being the coronavirus pandemic and the global economy (see p12). This year could also be a turning point for the energy transition, with oil and gas companies increasingly looking to make green investments and decarbonise their operations, as revealed by a new DNV GL report (p16). Reducing methane emissions can play an important role here (p26).

One country which is experiencing particularly positive oil and gas developments is Egypt, which has seen a flurry of activity and some important new discoveries, as it seeks to become a regional energy hub (p22).

Other highlights in this issue include an interview with Weatherford's new CEO, Girish Saligram, who highlights the strategic importance to the company of the Middle East and its collaborative approach to technology development (p24).

We also look at how API standards set the bar for compressed air systems in the oil and gas sector (p32), and the latest gas detection solutions (p30).

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Front cover image: Adobe Stock

→ Executives' Calendar, 2021

FEBRUARY			
15-17	ME-TECH 2021	VIRTUAL	www.europetro.com/event/357
22-23	GDA Virtual Event	VIRTUAL	www.gdaconference.org/gda-virtual
23-25	IP Week	VIRTUAL	www.ipweek.co.uk
MARCH			
8-12	SPE/IADC Virtual Int'l Drilling Conference & Exhibition	VIRTUAL	www.drillingconference.org/international
APRIL			
6-7	UAE HSE Forum 2021	DUBAI	www.hse-forum.com
MAY			
24-27	Middle East Oil & Gas Show (MEOS 2021)	MANAMA	www.meos-expo.com
31-2 June	EGYPS	CAIRO	www.egyps.com
JUNE			
14-16	Middle East Energy	DUBAI	www.middleeast-energy.com
AUGUST			
16-19	OTC	HOUSTON	2021.otcnet.org

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

From crisis to low carbon opportunity: A decade of delivery for the oil and gas industry

THIS COMING DECADE will be defined by three historic, global challenges: building a resilient recovery from the devastating COVID-19 pandemic; achieving the UN goal of universal access to energy for all populations; and charting an ambitious course – at COP26 and beyond – for tackling the threat we all face from the climate emergency.

Today's oil and gas sector faces the toughest of operating environments, but the ingenuity of its people, its engineering capabilities and innovative spirit will all be pivotal in rising to these global challenges.

Energy sector leaders and influencers from around the world will gather virtually for IP Week 2021, from 23-25 February, the pre-eminent international event convened by the Energy Institute for building collaboration between industry, government and society. Participants will have the opportunity to hear the latest updates, debate key issues and network to form new partnerships.

Topics explored include:

- Climate emergency and the pandemic aftershock – opportunities out of the crisis?
- The geopolitics of energy transformation
- Reinventing the energy industry in response to climate change and COVID-19
- Pathways for accelerating the low carbon transition
- Exploring the transport industry journey to net zero
- Asia's pathway to a low carbon future
- Sub-Saharan Africa's sustainable growth and development: its roadmap and progress towards low carbon.

Confirmed speakers include the CEOs of BP, Equinor, Total and ConocoPhillips; upstream directors of Shell and Eni; Nigel Topping, high level climate action champion, UNFCCC COP26; HE Mohammad Sanusi Barkindo, secretary general, OPEC; Dr Fatih Birol HonFEI, executive director, IEA; Giovanni Serio, global head of research, Vitol; Dr Leila R



IP Week will take place virtually from 23-25 February.

Benali, chief economist, energy economics, strategy & sustainability, APICORP; Mohammed Al-Qahtani, senior vice president downstream, Aramco; Dr Nikolas Meitanis, advisor, office of the CEO, Masdar; Reem Abdullah Al-Ghanim, head of HR & support services - chemicals business, Aramco; Mariam Musallam Al-Qubaisi, head of sustainability, government, international & communications, Etihad Airways; Dr Angela Wilkinson, secretary general, World Energy Council; and Dr Ivan D Ivanov, team lead, occupational and workplace health, environment, climate change and health department, World Health Organisation (WHO).

Energy Institute are offering Oil Review Middle East subscribers 20% off the published price. Please use promo code ORAMEIP20 when booking.

For more information and to book your place, please visit ipweek.co.uk or contact Amna at akhan@energyinst.org.

Coming together to further HSE best practices

With the current climate highlighting the importance of a best-in-class HSE mechanism, the UAE HSE Forum 2021 will address the latest regulatory developments and best practices to optimise HSE performance in the region.

THE HIGHLY ACCLAIMED UAE Health, Safety & Environment Forum is returning to Dubai for its sixth edition. Taking place from 6-7 April 2021, the Forum has a stellar line-up of confirmed speakers from Ministry of Health & Prevention, UAE, Dubai Municipality, DEWA, Dubai Civil Aviation Authority as well as senior executives from leading international and regional companies.

On the agenda for this year's forum are sessions addressing the most business-critical aspects of HSE in the UAE. With a vision of 'sustainability being key to the UAE's future readiness', an investment of US\$1.8bn is currently under implementation by Dubai Municipality for environment and sustainable projects in an effort to preserve the environment and protect the health and safety of people in the UAE.

The forum will focus on six key sessions: exclusive regulatory updates to optimise organisational HSE performance; best practices on HSE operations post COVID-19; sustainability to reduce carbon footprint for your business; digital transformation and the impact of disruptive technologies and high speed communication; working in hazardous environments; and transformative technologies that are having an impact on HSE projects.

The topics that are crucial for major sectors such as oil and gas, construction, utilities, logistics and transportation, manufacturing, and entertainment present an opportunity for attendees to gain deep insights on policy, strategies and technical expertise.

The forum brings together industry experts from across the region, including health and safety professionals, government regulators, policy makers and solution vendors.

Expert speakers from the industry include Habiba Al Marashi, chairperson, Emirates Environmental Group; Dr. Maisoon Ali Al Shaali, head of Environmental Section, UAE Ministry of Health and Prevention; Dr. Moha Shawki, specialist - Occupational Medicine,



The forum will provide a platform to share best practices.

UAE Ministry of Health and Prevention; Dr. Mohammed Aref, QHSE expert, Ministry of Human Resources & Emiratisation; Saleh Nuaimi, head of Safety, National Crisis & Emergency Management Centre, UAE; and many more.

"These events are becoming increasingly necessary in the existing business environment. The need for education and orientation to the safety culture has risen and

companies are gradually learning the need of using standardised/certified products. The forum targets decision-makers from industries across the UAE and ensures they take home valuable information through the different presentations and topics being discussed in this forum. I feel the event has been a success and such events should be held more frequently," said Syed Faroukh Ali, sr. territory manager, Ansell, who attended the 2019 edition.

The HSE UAE Forum 2021 is the latest in the highly acclaimed event series, now in its sixth year, designed to highlight best practices, process improvements, technology advancements and innovative applications for the enhancement of HSE performance in the region. ■

To find out more, see <https://hse-forum.com/dubai/conference-brochure>

“On the agenda for this year's forum are sessions addressing the most business-critical aspects of HSE in the UAE.”

Total enters operated exploration permit in Egypt

AN INTERNATIONAL CONSORTIUM led by Total and the Egyptian Natural Gas Holding company (EGAS) have signed an exploration and production agreement for the North Ras Kanayis Offshore block located in the Herodotus Basin, offshore Egypt in the Mediterranean Sea.

Total has a 35% operating interest, Shell 30%, KUFPEC 25% and Tharwa 10%. This exploration block covers an area of 4,550 sq km, extending from five to 150 km from the shore, with water depths ranging from 50 to 3,200 m. The Herodotus Basin is an underexplored area and the agreement includes a 3D seismic campaign during the first three years.

"Total is pleased to further strengthen its Eastern Mediterranean position as an operator of this exploration and production agreement," commented Kevin McLachlan, senior vice-president exploration at Total. "We are excited by the exploration potential of the North Ras Kanayis Offshore block. It reinforces our presence in Egypt, following a gas discovery made in July 2020 with the Bashrush well on the North El Hammad license, to be developed through a tie-in to nearby existing infrastructure."



Total holds a working interest of 25% in the North El Hammad license.

Image credit: Adobe Stock

Shamaran achieves 40mn bbl Atrush oil production in Iraq

Shamaran Petroleum Corp has announced that the total cumulative crude oil production in Atrush field, located 85km northwest of Erbil and one of the largest new oil developments in the Kurdistan Region of Iraq, has exceeded 40mn bbl. The field was first discovered in 2011 and oil production started in July 2017. In its fourth year of production, the Atrush field has sold all its production to the Kurdistan Regional Government of Iraq at international market prices less a discount based on quality and transportation charges.

Shamaran president and CEO Dr Adel Chaouch, said, "Following a challenging 2020 for the oil industry in Kurdistan, Shamaran is pleased to start off 2021 with the full and timely payment of the semi-annual interest owed to our bondholders. Our achievement of this 40mn bbl production milestone also demonstrates the ability of Atrush field to maintain stable production even through the past difficult times. We look forward to future achievements."

Tethys Oil starts Oman Block 49 drilling operations

OMAN'S TETHYS OIL has commenced the drilling operations of exploration well Thameen-1 on Block 49, planned to be drilled to a depth of around 4,000m below ground.

Primary target is the Late Ordovician Hasirah Sandstone layer at a depth of 3,500m (TVD). A secondary target is the Mid-Ordovician Saih Nihayda Sandstone at a depth of 3,700m (TVD). In addition, the well will also investigate the shallower Gharif Sandstone.

"We are delighted to have started drilling operations on Block 49. The Thameen-1 well is designed to penetrate several potentially hydrocarbon bearing rock layers. We have three defined targets, but we will analyse all data from the well to increase our understanding of the potential oil plays in the block, conventional as well as unconventional," said Magnus Nordin, managing director of Tethys.

Block 49 is an onshore block that covers 15,439 sq km in the south west of the Sultanate of Oman within the Governate of Dhofar. The drill site is located within the northern part of the block, at Marsudad village in the Wilayat of Muqhsin. Tethys Oil, through its wholly owned subsidiary Tethys Oil Montasar Ltd, has signed a contract with Abraj Energy Services SAOC for the provision of the Abraj-204 drilling rig. Tethys Oil entered into a farmout agreement with EOG Resources (EOG) in November 2020, whereby EOG acquired a 50% interest in the exploration and production sharing agreement covering Block 49.



Drilling operations are expected to last around 45 days.

Image credit: Adobe Stock

Fossil fuel demand is set to peak in 2027

ACCORDING TO RESEARCH by McKinsey & Company, aggregate fossil fuel demand is set to peak in 2027, with oil peaking in 2029 and gas in 2037, partially due to the impacts of COVID-19.

The Global Energy Perspective 2021 report finds that while coal demand has peaked already, peaks in demand for oil and gas are not far behind – falling in 2029 and 2037, respectively.

The pandemic has resulted in a profound reduction in energy demand, from which McKinsey expects it will take between one to four years to recover – with electricity and gas demand expected to bounce back more quickly than demand for oil.



Image credit: Adobe Stock

The pandemic has resulted in a profound reduction in energy demand.

However, demand for fossil fuels will never return to its pre-pandemic growth curve. Over the long-term, the impacts of behavioural shifts due to COVID-19 are minor compared to "known" long-term shifts such as decreasing car ownership, growing fuel efficiencies and a trend towards electric vehicles.

Christer Tryggstad, senior partner at McKinsey, commented, "While the pandemic has certainly provided a substantial shock for the energy sector across all fuel sources, the story of the century is still a rapid and continuous shift to lower-carbon energy systems."

"The share of electricity in the energy mix is set to grow by around 50% by 2050 and it is set to capture all global energy growth as hydrocarbon consumption plateaus. However, in our reference case, fossil fuels continue to play a significant role for the foreseeable future."

Indeed, while energy systems around the world will shift to renewables, which are able to compete with the marginal cost of fossil power already today in most places, by 2050 more than half of all global energy demand will continue to be met by fossil fuels in McKinsey's reference case scenario.

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Stormy year for oilfield services industry as 2020 sees slump in contracts

THE COVID-19 PANDEMIC caused the value of 2020's awarded contracts to slump to a 16-year low of US\$446bn, 30% down from 2019's US\$641bn, according to Rystad Energy analysis. The supply segment that declined the most in 2020 was construction and installation with a 59% drop, followed by equipment (-46%), stimulation (-45%) and engineering (-41%). Drilling tools and services, seismic and G&G, OCTG, land and offshore drillers, SURF and subsea equipment all declined by between 30% and 40% last year.

The supply segments that fared better were operational support, with awarded contract value dropping 9%, subsea services (-9%) and offshore facility leasing companies (-11%). The only supply segment that managed to score better than in 2019 was maintenance, rising 2.1% in 2020 to US\$72bn.

"The past year has been a stormy one for the oilfield services industry. Out of the handful of contracts awarded, Brazil and Norway offered the lion's share. Meanwhile, several already awarded contracts came under scrutiny, with many contractors receiving requests for revised prices," said Chinmayi Teggi, energy research analyst at Rystad Energy.



Oilfield services have suffered as a result of the pandemic.

Image credit: Shutterstock

NOGA and Eni Rewind sign to develop circular economy initiatives in Bahrain

THE NATIONAL OIL and Gas Authority (NOGA) of the kingdom of Bahrain and Eni Rewind, Eni's environmental company, have signed a MoU in the presence of HE Shaikh Mohammed bin Khalifa Al Khalifa, Minister of Oil and Claudio Descalzi, CEO of Eni to identify and promote opportunities for water, soil and landfill management and repurposing in Bahrain.

The agreement marks another step in the collaboration between NOGA and Eni to strengthen the cooperation in the energy sector in Bahrain, achieved through the launch of new initiatives in areas of mutual interest, including exploration, LNG supply and renewable energy.

The MoU is expected to contribute towards opening wider horizons of joint cooperation to reach innovative solutions in favour of the circular economy, taking advantage of the three principles: reduce, reuse and recycle. The partnership will benefit from the long-standing experience of Eni Rewind, Eni's environmental company, in this field and its specialists in terms of expertise and modern technologies for managing water, soil and industrial waste, providing environmentally-friendly solutions.

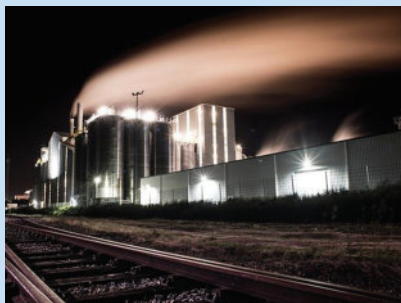
GETI 2021: Oil and gas workforce in a crisis of confidence

THE FIFTH ANNUAL *Global Energy Talent Index* (GETI), one of the world's largest energy recruitment and employment trends reports, has showed that the COVID-19 pandemic has ushered in a crisis of confidence for the oil and gas workforce.

The report by Airswift, the global workforce solutions provider for the energy, process and infrastructure sectors, and Energy Jobline, the world's leading jobsite for the energy and engineering industries, reveals that 78% of oil and gas professionals feel less secure in their jobs than they did a year ago, with two-thirds blaming the pandemic for their anxiety. These worries are shared by hiring managers, 77% of whom consider their employees' jobs less secure than they were last year.

Driving this, a sense of precarity hovers over the whole sector. Around 42% of survey respondents believe the oil and gas market has contracted over the past year – and 24% characterise this as a "strong contraction."

However, there remains plenty of hope for the future. Around 57% of respondents believe their employer is resilient to both recent and future changes, and 64% expect the sector to grow over the next three years. The same number feel that advances in engineering techniques and technologies will be among the most important opportunities for oil and gas businesses over the period.



Technology and energy transition create a clear opportunity in the oil and gas sector.

Image credit: Rudy and Peter Skitterians/Pixabay

Mubadala and Siemens Energy to accelerate green hydrogen capabilities in Abu Dhabi

MUBADALA INVESTMENT COMPANY (Mubadala) and Siemens Energy have signed a MoU to create a strategic partnership to drive investment and development of advanced technology, manufacture of equipment and green hydrogen and synthetic fuel production.

The initial focus of activity will be in Abu Dhabi and it is intended this will be expanded to international markets over time.

Together with Masdar and other energy players in the Mubadala Group, the companies will work closely towards the following goals:

- Utilising renewable energy to produce green hydrogen and synthetic fuels, providing clean and transportable energy to fuel new hydrogen-based ecosystems that are supplied from the UAE.

- Establish an Abu Dhabi-headquartered world-class player in the synthetic fuels sector.

- Jointly advance technology and drive down the costs of green hydrogen and synthetic fuels production.

- Enable Mubadala and Siemens Energy to access emerging hydrogen markets and create value for both parties.

Commenting on the importance of the MoU Musabbeh Al Kaabi, CEO of the UAE Investments, Mubadala, said, "Through this strategic partnership, we expect to be able to leverage Abu Dhabi's strong foundations for the production and sale of green hydrogen, prove a strong business case and attract investment for the development of new facilities, and establish Abu Dhabi as a reliable supplier of green hydrogen to global markets."

"This strategic partnership highlights the UAE's visionary commitment towards developing a sustainable, green hydrogen economy," said Dietmar Siersdorfer, managing director Siemens Energy Middle East.

This agreement is testament to the strategic Abu Dhabi Hydrogen Alliance formed between Mubadala, ADNOC and ADQ. The first initiative under this agreement and the broader Abu Dhabi Hydrogen Alliance will be the consideration of a demonstrator plant located at Masdar City, to be developed under a specific agreement involving Siemens Energy and Masdar, and a number of other key players in the technology, distribution, and end-use portions of the green hydrogen value chain.

Oil and gas industry to play key role in providing climate change solutions

THE UAE LOOKS forward to working closely with the Biden Administration on global efforts to mitigate climate change while accelerating post-COVID-19 economic recovery according to His Excellency Dr Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology and group CEO of the Abu Dhabi National Oil Company (ADNOC).

Speaking at the fifth Atlantic Council Global Energy Forum which took place virtually as part of the Abu Dhabi Sustainability Week (ADSW), HE Dr Al Jaber said, "Our strategic alliance with the USA is also very strong. As both our countries emerge from the pandemic, I believe there are great opportunities for collaboration across the energy sector and a variety of other sectors. Starting with energy, we have key concession and exploration partnerships with ExxonMobil, Occidental and Baker Hughes, among others. Near term, there is room for deepening cooperation around unconventional oil and gas, which we are discovering in Abu Dhabi."

HE Dr Al Jaber was speaking during an interactive session with Amos Hochstein, the former United States Special Envoy and Coordinator of International Energy Affairs. Oil and gas will play an important role in the transition to a lower-carbon future and should be at the centre of the conversation on climate change, according to HE Dr Al Jaber.

"Here the UAE has a dual advantage: a leadership that has always put environmental protection first, and a natural advantage because our geology gives us some of the least carbon-intensive oil in the world. And we are building on this position by reducing our carbon intensity by a further 25% over the next 10 years, by enhancing efficiencies and expanding our industrial-scale CCUS facility, which is the first and largest in the region," HE Dr Al Jaber said.



Image credit: ADNOC

A game-changer in the energy transition

He highlighted that the UAE is exploring the potential of new fuels such as hydrogen which could be "a game-changer in the energy transition." ADNOC already produces around 300,000 tons of hydrogen a year as part of its current industrial processes and HE Dr Al Jaber said the company is exploring the viability of markets in Asia and Europe and will build the business case as those markets develop, to position the UAE as a major supplier of blue hydrogen.

"The UAE has always made positive contributions to global challenges and the challenge of climate change is no different. This is the ethos that guided us to launch Masdar 15 years ago and to shape it into becoming a clean technology hub and the permanent home to the International Renewable Energy Agency (IRENA).

"Masdar is an active investor in renewable energy in the UAE and around the world, with projects in 30 countries,

including right here in the UAE. So we not only talk the talk, we walk the walk and we've seen first-hand, how smart investment in diversifying the energy mix can pay off," HE Dr Al Jaber said.

Reinforcing the UAE's commitment to mitigating climate change, HE Dr Al Jaber pointed out that the country was the first in the region to sign the Paris Accords. He added that following the submission last month of the UAE's second Nationally Determined Contribution (NDC) to the Secretariat of the UN Framework Convention on Climate Change (UNFCCC), it has become the first country in the region to commit to an economy-wide emission reduction.

"Reducing carbon is something we can all agree is a common goal, but it should not undermine the ability of emerging economies to give their people a better future. We need to create the right mechanisms in terms of funding, energy mix and broader economic development that strikes the right balance," HE Dr Al Jaber said.

EDO transitional leadership team ratified by new company board

PETROLEUM DEVELOPMENT OMAN'S (PDO) finance director Haifa bint Juma Al Khaifi has been appointed as the CEO of Energy Development Oman (EDO) that was officially formed through Royal Decree 128/2020, marking a major milestone in PDO's journey towards becoming a fully-fledged energy company.

Key personnel in the company's transitional leadership team as ratified by the EDO Board also included PDO gas director Moutaz Al Riyami as chief strategy and commercial officer; Ibrahim Al Eisri as chief financial officer; PDO planning and deal lead Ibrahim Al

Waili as corporate planning and services officer; and PDO finance controller Saif Al Harthy as board secretary.

Al Khaifi said, "The establishment of EDO is an extremely significant milestone for the Sultanate of Oman. Having led the establishment of EDO over the past year, and being a member of its Founder's Committee, I am deeply honoured by my appointment as the transitional CEO during this critical and exciting stage. I look forward to continue delivering extensive value to Oman with EDO, in addition to my role as the finance director of PDO."



Image credit: PDO

Haifa Al Khaifi is the new CEO of EDO.

Al Khaifi added, "EDO will play a central role in the Sultanate's energy transition as well as economic diversification."

IEA announces key projects to guide clean energy transition

Faith Birol, executive director at the International Energy Agency (IEA), has outlined the IEA's five key projects to ensure that 2021 is a positive year for the global transition to clean energy.

BIROL, SPEAKING ON an online broadcast, noted that 2020 was a huge shock to the energy market, with global energy demand falling by 5% (seven times deeper than the decline after the financial crises in 2008). This resulted in global emissions declining by around 7%, bringing global emissions back ten years.

The director was keen to emphasise that while the fall in emissions was of course positive, this was caused by a decline in energy demand, not by structural policies to reduce emissions and accelerate clean energy. Additionally, the IEA has calculated that once COVID-19 begins to recede and global economies begin to bounce back, fossil fuel consumption will also recover. 2021 therefore presents a unique opportunity to make some real progress on green initiatives.

Birol commented, "This year is pivotal for the world. Many large economies have committed themselves to net zero targets by the mid-century, as have large energy companies. In 2021, we will see a huge amount of stimulus packages from major economies; trillions of dollars injected into the global economy and I hope they put clean energy at the heart of these recovery plans. In 2021, leaders of the world will gather together at COP26. Expectations are running high and we looking forward with great optimism that world leaders will agree and ensure the energy industry and its investors know what will be profitable and what won't be."

To make sure that this golden chance is not wasted, Birol stated that his priority was to ensure that the IEA leads the global clean energy transition in a secure and affordable way. He outlined five key projects in pursuit of this:

Special report entitled 'The World's Roadmap to Net Zero by 2050'

This will identify what is needed for the government, investors, industry and citizens to decarbonise the energy sector and turn ambitions into reality. The study will provide



Faith Birol, executive director at the International Energy Agency.

concrete recommendations so that policy makers around the world can make the best decisions for themselves and the planet. It will be released on 18 May.

IEA Clean Energy Transitions Summit

Last July witnessed the first inaugural Clean Energy Transition Summit, which featured more than 40 ministers from around the world, representing countries that account for around 80% of global emissions. This year the IEA will call for another summit and expand participation for more ministers, as well as energy industry leaders and investors. This event will take place on 31 March.

“Our climate challenge is essentially an energy challenge.”

Global Commission: Our Inclusive Energy Future

A key aspect of the clean energy transition is to ensure the social and economic impact on individuals are considered, and that this process is as fair and inclusive as possible. Birol will convene a new high level global commission to bring together a panel of government and industry leaders to examine these issues. The commission will be headed by the prime minister of Denmark, Mette Frederiksen.

Special report on Financially Clean Energy Transitions in Developing Economies

Noting that the emissions are growing most of all in developing countries in regions such as Southeast Asia and Africa, the IEA will produce a report to provide advice on building green energy in these areas. This project is being produced in collaboration with the World Bank and the World Economic Forum and will be released during the annual meeting of the World Economic Forum in May.

Special report on the Role of Critical Minerals in Clean Energy Transitions

Energy security is a critical issue and if transitions across the world are not secure then they will not be repeated. This report will focus on ensuring clean energy technologies can rely on a sufficient supply of critical minerals and that these are acquired responsibly. It will be released in April.

Birol concluded, "The energy that powers our daily lives and our economies also produces three quarters of global emissions. This means that our climate challenge is essentially an energy challenge. The IEA is determined to take on that challenge and lead clean energy transitions around the world."

"There are three dimensions to this. First, ensure that the world has a clear understanding of how this transition can happen. Second, help government, companies, and citizens meet their ambitions. Third, track and monitor the progress of countries in order to reach their targets." ■

Aubin Group wins new business contracts

AUBIN GROUP, DEVELOPER and supplier of chemical solutions to the global energy industry, has announced a series of contract wins, valued at more than US\$16mn.

The deals which will see the firm develop and deliver a range of its specialist products to clients include a five-year extension to an existing contract with an Oman-based energy services firm and a number of new agreements with oil and gas companies in Saudi Arabia and the UAE.

The announcement follows a positive year for the Group, despite challenging global conditions.

"The Middle East is a critical area of focus and these latest contracts provide us with a strong platform for future growth. We are actively building our presence in the region by forging strong partnerships within the energy sector and identifying opportunities to manufacture our unique chemicals across the region.

"We are also very excited by the prospects this year brings, as we near the introduction of game-changing technologies across a number of energy and non-energy sectors," said the CEO of Aubin Group, Katy Gifford.

"We're extremely proud to continue working with our existing clients, some of whom we have been working with more than 20 years. We look forward to supporting both existing clients and welcoming new clients from around the globe. To achieve the financial results that we have, given the challenges is a true credit to the determination and expertise of our team," added Gifford.



The deals will see the firm develop and deliver a range of its specialist products to clients.

Image Credit: Aubin Group

Penspen secures additional project

PENSPEN, A GLOBAL provider of engineering and project management services to the energy industry, has secured a detailed engineering project award from Target Engineering Construction Company, an EPC contractor in Abu Dhabi, UAE.

Penspen will undertake engineering works for the existing T-1517, 1518 and 1519 crude oil tanks in the Jebel Dhanna Crude Receiving facility. This is in addition to the ongoing detailed engineering contract awarded to Penspen by Target Engineering for the facility in Jebel Dhanna last year.

The scope of engineering support services Penspen will provide includes a site survey, insulation selection, tank dome roof design and a tank shell adequacy check due to the additional loading that will be taking place. Checks for both tank foundation adequacy and tank shell and foundation/anchor bolt adequacy for wind and seismic activity, will also be undertaken.

"We are confident that our expert services will be delivered seamlessly and build upon the excellent relationship between Penspen and Target Engineering," said Neale Carter, Penspen's EVP for the Middle East, Africa and Asia Pacific regions.

SNOC launches gas storage project

SHARJAH NATIONAL OIL Corporation (SNOC) has announced the start-up of its new gas storage project. This follows a small-scale pilot phase using existing infrastructure that has been running since early 2017.

The first gas was introduced to the project on 1 January 2021 following a turbulent year, and marking a new era for SNOC. The project was completed on time and on budget and within a year from the EPC contract being awarded in December 2019.

SNOC will enter into a new area of business with the completion of this project and will help balance the gas supply and demand for Sharjah and meet the required supply flexibility for Sharjah's power sector.

"The completion of this project is an outstanding achievement considering the local and international supply chain challenges we met due to the COVID-19 pandemic. It was completed without any operational, safety or environmental incidents," said Hatem Al Mosa, CEO of SNOC. "The timely launch of this project is a major new business development activity for SNOC. It will allow us to store excess gas in the winter to satisfy the summer peak demand as well as provide a readily available strategic reserve for energy security allowing us to respond to unexpected operational or market issues," he added.

The project included the installation of high pressure (HP) gas compression units, HP gas pipeline, utilities and support facilities, metering and tie-ins to existing plant and wells.



SNOC will enter into a new area of business with the completion of this project.

Image Credit: SNOC

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The oil market: hard climb ahead

Following a tumultuous year, economist Moin Siddiqi assesses prospects for the oil market in 2021.

THE COVID-19 CLOUD inflicted colossal damage to the global economy, and by extension to all areas of the energy industry. The cumulative loss in world output relative to the pre-pandemic forecast path is projected to grow from US\$11 trillion over 2020-21 to US\$28 trillion over 2020-25, according to the International Monetary Fund (IMF). The fallout pushed fuel demand and prices to multi-year lows. Oil was the worst performing commodity of 2020, even falling behind coal.

The pandemic may have a prolonged impact on future supply-demand patterns. This reflects muted gasoline demand due to less office commuting, and reduced jet fuel demand due to more Zoom meetings and less business travel. Some experts anticipate an 8% decline in overall energy usage up to 2050 as the structural changes caused by COVID-19 affect consumption.

The risk of a new 'supply crunch' is high, given five years of underinvestment and deep capital expenditure (capex) cuts in 2020. Oil

“The pandemic may have a prolonged impact on future supply-demand patterns.”

Global oil demand and supply balance (mn bpd)

	2018	2019	Projections	
			2020	2021
Total petroleum consumption (incl. liquid fuels)	100.00	101.23	92.21	97.77
of which: OECD 35 countries [1]	47.63	47.55	41.92	44.39
Emerging & developing economies	52.38	53.68	50.29	53.38
Total production [2]	100.41	100.61	94.23	97.13
of which: Non-OPEC supply	63.17	65.98	63.67	64.89
Global balance (closing year-end) [3]	0.41 *	0.62 #	2.02 *	0.64#
OECD commercial inventories	2,883	2,879	3,051	2,951

1. Organisation for Economic Cooperation & Development, representing industrial nations

2. Crude oil, lease condensate, shale oil, oil sands, natural gas liquids & biofuels

3. The oil market should regain some semblance of a balance in H2 2021, buoying prices

* Inventory build; # Inventory draw

Five largest crude oil producers, 2020 est. (mn bpd): USA (11.29); Russia (10.50);

Saudi Arabia (9.21); Canada (5.28); Iraq (4.06), representing 43% of global output.

Top five oil consuming economies, 2020 est. (mn bpd): USA (18.16); China (14.31);

India (4.36); Russia (3.73); Japan (3.23), representing almost half of global consumption.

Source: EIA Short-term Energy Outlook, January 2021

and gas is a depleting resource with an average annual production depletion rate of 6-7%. The industry needs to invest more than US\$525bn/year to offset natural field declines and replace annual consumption (Rystad Energy).

Thus, in the medium to long term, underinvestment could affect supplies, especially from non-OPEC regions. Saudi Aramco has voiced concern that the current downturn would severely constrain future investment in upstream oil and gas. Goldman Sachs also agrees structural under-investment

in the hydrocarbons sector will put upward pressure on future energy prices.

Key themes dictating the short-term outlook

Will 2021 offer much-needed relief after an unprecedented and historic turbulence in energy markets? The coronavirus pandemic and the global economy (together) will influence the pace of oil recovery, along with a number of other factors.

1. Excepting China, output in both advanced nations and emerging market and developing economies (EMDEs) in 2021 is expected to fall below 2019 levels. Countries reliant more on contact-intensive services and oil exporters face weaker recoveries compared to manufacturing-led economies. “Even when the virus is controlled, economies are expected to still have to deal with the adverse impact of deteriorated fiscal balances and the effect of muted business investment on the labour market and consumer spending in 2021,” notes the IMF.

After the rebound in 2021-22, global growth is projected to average around 3.5%

Global growth projections (real GDP, annual % change)

	2019	Forecasts	
		2020	2021
World output	2.8	-4.4	5.2
Advanced economies	1.7	-5.8	3.9
of which: USA	2.2	-4.3	3.1
Emerging & developing economies	3.7	-3.3	6.0
of which: China	6.1	1.9	8.2
World trade volume of goods & non-factor services	1.1	-9.5	5.0

Oil prospects hinge on mass vaccinations and a strengthening global economy.

Sources: IMF, World Economic Outlook, October 2020 & World Bank Global Economic Prospects, January 2021

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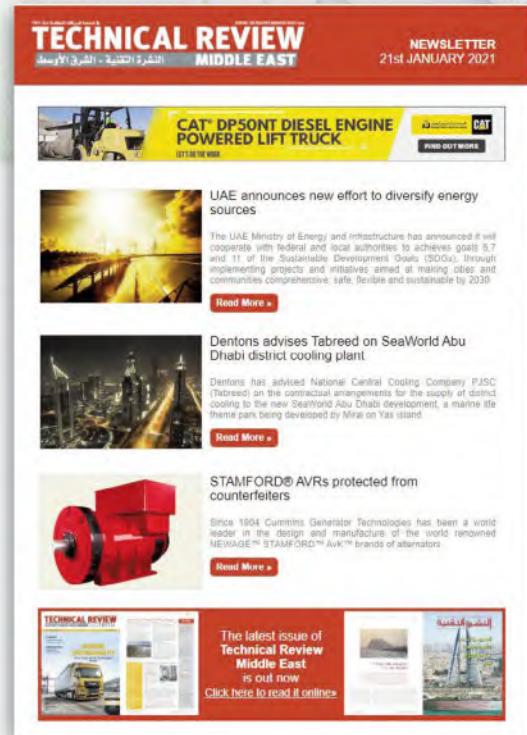
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over the medium term. Growing restrictions on trade and investment and rising geopolitical uncertainty could derail the recovery. On the upside, faster and more widespread availability of tests, treatments, vaccines, and further stimulus packages can significantly improve outcomes. A good sign is that hedge funds and money managers are turning bullish on the oil outlook as they exit from safe-haven assets, such as gold and US dollar to high-risk equities and commodities.

2. Forecasts by the International Energy Agency (IEA) and OPEC do not expect 2021 oil demand returning to pre-downturn levels. It could rebound by 5.5-6mn bpd on an annualised basis compared to 2020, but consumption is still falling 3-5% below that of 2019. IHS Markit expects near-full recovery by early 2022. Royal Dutch Shell and BP support the notion that the world may never return to 'normal' pre-virus levels of consumption of around 100mn bpd.

Generally, the 2021 outlook assumes an uptick in global economic activities supporting demand for industrial fuels, especially in OECD Americas and China. This includes higher infrastructure spending, as well as the revival of construction and manufacturing sectors. Travel and tourism are not likely to achieve pre-Covid levels of activity for the next few years. "Passenger volumes are not expected to return to 2019 levels until 2024 at the earliest, with domestic markets recovering faster than international services," comments the International Air Transport Association (IATA).

3. The OPEC+ group is trying to control the market by balancing the supply side of the equation. Monthly OPEC+ ministerial meetings will decide whether output should increase, decrease, or hold steady. Demand for OPEC crude in 2021 stands at 27.2mn bpd, 5mn bpd up on 2020. The OPEC+ discipline should reduce stockpiles in the near-term, but inventory overhang is substantial. On the supply-side, the risks are tilted to the downside, with surging Libyan production and Norway ending its oil cuts from end-2020. Possible lifting of US sanctions on Iran and

Oil price predictions, 2021 (Brent crude, the global benchmark for oil prices)

	US\$/bbl
Goldman Sachs	65.0
Citigroup	55.0
U.S. Energy Information Administration	52.7
World Bank	44.0
International Monetary Fund	50.0
Fitch Rating	45.0
Moody's Investors Service	40-45 range
Barclays Commodities Research	55.0
S&P Global Platts	mid 40s - 50
Rystad Energy	44.0

The poll of 39 oil market analysts conducted in mid-Dec 2020 forecast Brent price would average US\$50.67/bbl in 2021.

Venezuela in 2021 could boost the 'supply glut' even further.

The OPEC+ alliance is vital for market stability. "If OPEC+ loosens the production cuts too quickly, there is a threat of a price setback. But if it is too cautious (and prices rise significantly), a rift could arise and US shale oil production could rise again," noted Commerzbank.

Oil price gains will depend on Asia's demand."

4. The downturn put an abrupt end to the US shale boom, which had hit 13mn bpd in February 2020. In May, US output fell to 10mn bpd (the lowest level since late 2017) as producers slashed spending on drilling in response to plunging oil prices. The EIA sees 2021 average output staying at around 11.1mn bpd (down from 12.2mn bpd in 2019), as production rates from existing wells in the US shale patch will fall faster than output gains from fewer newly drilled wells.

Some analysts cautioned against writing off US shale potential – expecting a surge this year and next. The outlook has improved in recent months, according to the Dallas Fed

Energy Survey, which showed that the business activity index moved into positive territory, rising from -6.6 in Q3 to 18.5 in Q4 2020. This was the first positive reading for the business activity index since Q1 2019, with optimism driven by both E&P and oilfield services firms, according to the survey. Producers have slashed their average breakeven costs over the past year by 20% to US\$45/bbl on average, which could help U.S. shale to rebound this year.

5. Crude oil futures are strongly correlated with observable OECD inventories, which totalled 3bn barrels at the end of 2020 (above the five-year average), according to the US Energy Information Administration (EIA). Even if the global economy recovers robustly, there is still a crude storage glut (both onshore and offshore) that needs to be drawn down before the market returns to more sustainable balance.

A return to normal stock levels would see prices rising towards H2 2021. But upside price potential could be capped by large OPEC production capacity – estimated by the EIA at 6.2mn bpd end-2020 – which, in the event of higher prices, will lead to a rapid increase in oil production by OPEC and non-OPEC producers.

6. Transportation fuels have suffered demand destruction, thanks to pandemic-related lockdowns and international travel restrictions. Recent data shows that road traffic remained below pre-crisis levels by 5%, 20% and 40%, in Asia, Europe, and the USA respectively. Plunging demand for jet fuel and kerosene will account for 80% of 2021's 3.1mn bpd gap in overall fuel consumption versus pre-pandemic levels (IEA). Global jet fuel demand comprises 8% of total oil consumption. According to IATA, 2.8bn passengers are expected to travel in 2021, up 1bn on 2020, but still 1.7bn fewer than in 2019.

The Revenue Passenger Kilometres – a figure used by the aviation industry to track the total number of kilometres travelled by paying passengers – is expected to increase 50% in 2021, but is still 50% below than in

The pace of demand growth (mn bpd)

	Change 2021/20				
	2019	2020	2021	Growth	(%)
OECD	47.69	42.16	44.75	2.59	6.1
of which: U.S.	20.86	18.62	19.89	1.27	6.8
Non-OECD regions*	52.07	47.86	51.17	3.31	6.9
of which: China	13.33	12.89	13.99	1.10	8.6
Global demand	99.76	90.01	95.91	5.90	6.5

* Includes Former Soviet Union (Russia) and emerging Europe

Demand for oil is dominated by transportation (cars, trucks/trains, planes and boats) and industry (plastics, fertilisers, steam/heat).

Passenger vehicles comprise around a quarter of total oil demand.

In sectoral terms, transportation & industrial sectors are expected to fuel oil demand rebound in 2021.

Source: OPEC Monthly Oil Market Report, January 2021

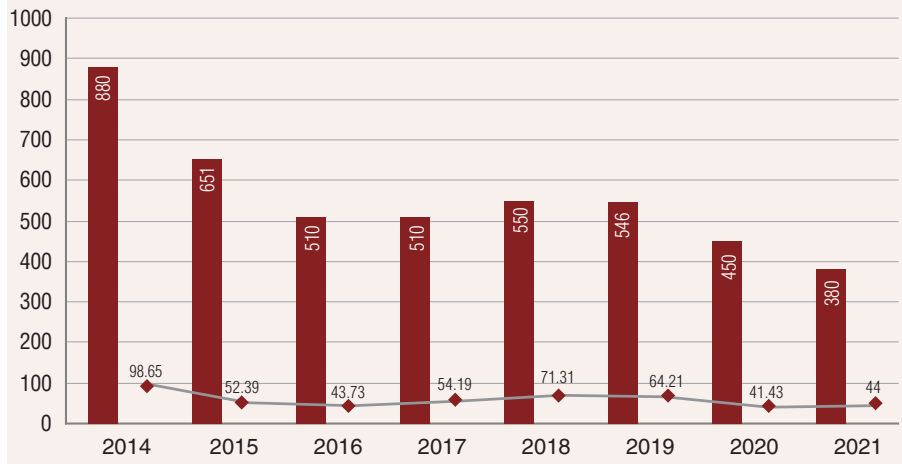
2019. Air travel is unlikely to rebound to pre-2019 levels until at least 2023.

7. Markets are buoyed by positive developments on COVID-19 vaccines that would boost economies and hence, oil demand. However, the real impact will not be felt until mid-2021 onwards because the progress with mass vaccination takes time. The coronavirus cases surge in the USA and Europe has led to renewed lockdowns, while in Asia, virus infections are relatively under control and energy demand is healthy. Thus, until fuel usage in major OECD economies recovers to a more sustainable level, oil price gains will depend on Asia's demand (led by China and India). The former is on track to exceed the USA as the number one oil refiner this year or in 2022. India is now the world's third-largest oil importer and consumer.

In sum, the world's most heavily traded commodity is vulnerable to external headwinds. "In view of the uncertainty surrounding the pace of the global economic recovery and the potential persistence of the crisis, predicting the state of the oil market becomes increasingly challenging," said Saudi Arabia's Finance Ministry.

Factoring in both upside and downside risks, oil prices could be in a tight-bound

Correlation between upstream capex and the oil price



Source: Rystad Energy & S&P Global Platts

Upstream capex (bars) in US\$bn; oil price yearly average (line) in US\$/bbl. 2020 capex volumes are the lowest in 13 years, due to the oil price slump.

range of US\$45-50/barrel in H1 2021 before reaching the mid 50s by third quarter of 2021, helped by an uptick in international trade. "For companies to produce oil profitably, Brent needs to trade around US\$50/barrel." (J.P.

Morgan). Return to a pre-pandemic oil market and the economy will, however, take some time; the market needs to address fundamental supply/demand issues and increase upstream investments. ■

Chronic under-investments in energy supply

GLOBAL CAPEX FOR exploration and production firms (E&P) fell by an estimated US\$100bn in 2020 or 18% versus 2019 levels (Rystad Energy). The expected decline makes 2020's capex volumes, estimated at around US\$450bn, the lowest in 13 years. "With a lower need and willingness among E&P companies to invest in oil and gas, capital expenditure across offshore, shale and conventional onshore resources will probably struggle to get back to 2019 levels," said Rystad Energy.

The IEA estimates that global hydrocarbons investment fell by one third year-on-year to US\$328bn in 2020 after three consecutive years of investment growth. Investment by energy majors dropped by around a quarter, while national oil companies (NOCs), which account for more than half of global production, also slashed their capex budgets – but on average less than the overall decline.

International Energy Forum (IEF) research indicates that every dollar of capex cut today will have twice as powerful effect in terms of reducing E&P activity compared to cuts after the 2014 oil price crash. The expected rate of decline in 2020 investment has exceeded the 25-26% decline in 2015-2016.

E&P companies' capex 2021 budgets are projected to reach only US\$380bn. Investments may rebound to pre-crisis levels of US\$530bn by 2023 if oil prices rise to around US\$65/barrel. In fact, after the 2014 oil crash, annual E&P investments never recovered to the zenith of around US\$880bn and instead settled at US\$500-550bn. "As E&P are also speeding up a transition into low-carbon energy, it is possible that this time, too, upstream investments will not return to pre-crisis levels in the long-term, even if they do recover somewhat over the next few years," says Rystad Energy.

Projected cost cuts will be mainly achieved by deferring infill-drilling programmes, delays to projects' final investment decisions (FIDs) and start-ups and cost cuts within E&P budgets for conventional assets, as well as reshaping of portfolios to stabilise returns and efficiency improvements. In nominal terms, offshore investment levels are expected to return to 2019 levels in 2023, with conventional onshore following suit in 2025 and shale in 2028.

In real terms (adjusting for inflation), however, investments in upstream oil

and gas may never make it back to 2019 levels. Most oil majors never fully resumed their appetite for expensive 'megaprojects' that take years to pay off. Instead the priority is high-value projects with a quicker return on investment, such as shale oil. Together with investor pressure – demanding higher dividends and stock buybacks – this has constrained capex budget plans of E&P players. According to ratings agency Moody's, energy companies' earnings before interest, taxes, depreciation, and amortisation (EBITDA) are 20% below the 2019 level – hence the necessity for budget discipline.

The oilfield service (OFS) industry also remains under severe pressure. OFS purchases are estimated to drop to US\$473bn in 2020 from US\$625bn in 2019 and remain flat in 2021 before starting a slow recovery. Rystad Energy sees OFS purchases returning to pre-crisis levels only after 2024 in nominal terms, reaching US\$642 bn by 2025.

Protracted 'under-investments' could prompt an energy crisis – hence ramifications for the global economy. Secretary general of the International Energy Forum (IEF) Joseph Moynihan told Al Arabiya, "I am concerned about the implications of a lack of investment, because if we're not investing in supply, decline rates in current existing wells could create some deficits in the future, and that will lead to higher prices. That's not good for the global economy."

The IEA also cautions that if upstream capex continues at 2020 levels over the next five years, it would reduce the previously forecast level of oil supply in 2025 by nearly 9mn bpd. The UK energy consultancy Wood Mackenzie agrees; "The world may be sleepwalking into a supply crunch, albeit beyond 2021. A recovery in oil demand to more than 100mn bpd by late 2022 increases the risk of a material supply gap later this decade, triggering an upward spike in prices."

The IEF comments that industry investment should increase over the next three years by around 25% annually from 2020 levels to avert a crisis.

"The global oil sector will need cumulative investment of US\$12.6 trillion in the upstream, midstream and downstream through to 2045," comments OPEC.

Turmoil & Transformation: outlook for the oil & gas industry

The oil and gas industry is doubling down on transformational green investments, and confidence in the MENA region, while considerably reduced from 2020, is higher than elsewhere. These are some of the main conclusions of a newly released report from DNV GL.

THE OIL AND gas industry expects to boost investment in the energy systems of the future this year, as companies seek to transform for the long term, according to *Turmoil and Transformation: The outlook for the oil and gas industry in 2021*.

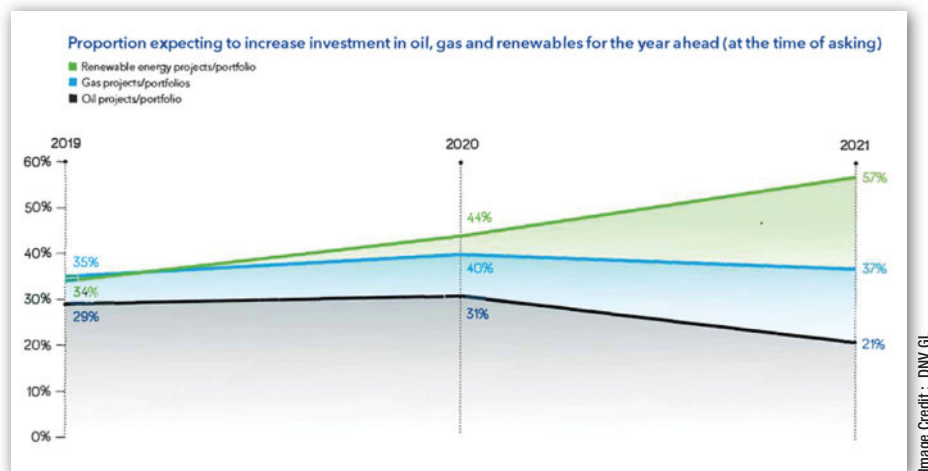
The report suggests priorities are shifting as investors reassess the risks of financing oil and gas projects, and as governments and industry pour billions into green recovery strategies following the Covid-19 pandemic. The research is based on a survey of more than 1,000 senior oil and gas professionals and in-depth interviews with industry executives.

Change in the energy mix

A record two-thirds (66%) of senior oil and gas professionals report that their organisation is actively adapting to a less carbon-intensive energy mix in 2021, up from just 44% in 2018. Some 57% plan to increase investment in renewables, up from 44% last year, while half (48%) expect to increase investment in green or decarbonised gas. BP, for example, aims to have 50GW of renewable generating capacity by 2030 – 20 times its current level – while cutting oil and gas production by 40% over the same period.

Just a fifth (21%) say they will increase investment in oil projects in 2021, as the sector increasingly comes to terms with the notion that the world's demand for oil has peaked or will peak in the short to medium term. Expectations for an increase in natural gas investment remain steady at 37%.

Respondents in the Middle East and North Africa are more likely than the global sample to say their organisation will be increasing investment in oil projects/portfolios in 2021 (28%), and significantly less likely to be investing in renewable or green/decarbonised gas projects. Nevertheless, there has been a significant jump in those respondents in the region reporting that they will be increasingly focused on opportunities outside of oil and gas – at 51% compared with 33% in 2020. A



whopping 72% think that hydrogen will be a significant part of the energy mix by 2030, and 73% believe that carbon capture and storage will become a significant commercial opportunity for the oil and gas industry by 2030 – higher than the global average of 68%. This can be seen as acknowledgement of the contribution CCUS can play in maintaining licence to operate, as well as of the commercial opportunity.

“Net-zero climate policies began to proliferate in 2020, from Europe to China, and made it onto the table in the USA. Long term, net zero policies have the potential to drive deep decarbonisation of the world's energy system,

outlook for 2021 is influenced by the possibility that this downturn may be different from those of the past. Perhaps the most significant difference for the industry for 2021, is the shift in capital away from fossil fuels.

“The financial markets – through the effects of the Covid-19 pandemic – have seen what peak oil demand could look like, and are increasingly factoring in changing sentiment in society towards a decarbonised future,” said Danielsen. “Decarbonisation has moved from something on the horizon to an immediate priority, and there are signs that our sector may invest to transform rather than cut its way out of the present crisis,” he adds.

The majority of senior oil and gas professionals expect these shifts in investment will lead to a wider reshaping of the industry. Eight in 10 (78%) believe there will be increased consolidation in the year ahead, up from 64% one year ago. Strategic reorientation may also involve asset and business sales, with 63% expecting more demergers, divestments and spin-offs, up from 46% last year.

Indeed, an estimated US\$100bn in oil and gas assets are being lined up for sale by BP, Chevron, ConocoPhillips, Eni, Equinor, ExxonMobil, Shell and Total. “Asset prices are very low,” says Ahmed Heikal of Qalaa

“Net zero policies...are already changing the direction of the oil and gas industry.”

and they are already changing the direction of the oil and gas industry,” says Hans Kristian Danielsen, vice president, DNV GL.

The oil and gas industry is moving through its third major downturn in 12 years, but the

Holdings, an Egyptian conglomerate with operations in midstream and downstream oil and gas. “But whether people want to invest in the oil and gas sphere is another question. It depends on your view on the transition to natural gas, renewables, and hydrogen. There are going to be a lot of changes in energy, and it is not clear how it will impact oil and gas transactions.”

Transformational investments come despite a crash in confidence for industry growth following the COVID-19 pandemic and subsequent oil and gas market crash. Only 39% of senior oil and gas professionals are confident about industry growth in 2021, down from 66% last year and 76% in 2019, although confidence in the MENA region is higher, at 49%. Organisational confidence is also slightly higher in the region, although considerably reduced from 2020, with 52% confident about their organisation's prospects in 2021 compared with 71% in 2020. Only 44% are confident about reaching revenue targets, compared with 70% in 2020. In common with respondents from other regions, MENA respondents cite the global economy and the oil price as the top barriers to growth, but competitive pressure appears to be a more significant issue in the region (28% compared with the global average of 19%).

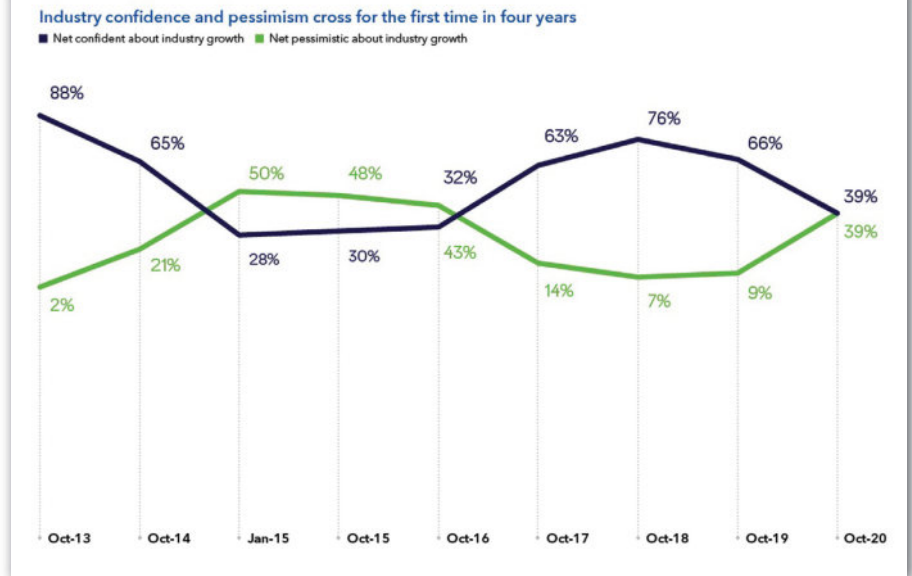
Cost efficiency remains a priority

Cost cutting will still be a universal priority (96%) for 2021, but the industry is already lean. A resilient 63% say their organisation will still achieve acceptable profits if the oil price averages between US\$40 to US\$50 per barrel in 2021. However, there are signs that traditional cost cutting methods are hitting their limits, and nine in 10 respondents from the MENA region believe cost cutting will be more challenging than ever in the year ahead, higher than the global average.

“The trouble with the industry's available cost efficiency levers is that most of them have been pulled quite hard already. Cost efficiency has been an uninterrupted priority in each of the past seven years. For some, it is getting harder to squeeze any more water from the sponge,” says Danielsen.

More transformation approaches are needed as traditional methods hit their limits. These limitations are likely to be the reason why 87% of respondents say that the industry needs to develop new operating models to achieve further cost efficiencies.

79% senior industry professionals want greater standardisation of tools and processes to reduce costs. “The industry needs to be as smart and efficient as ever, so we are seeing far greater collaboration and standardisation,” says Wendy Brown, environmental director of International Oil & Gas Producers (IOGP). The industry is also continuing to invest in the efficiency of assets in operation and extending the lifespan of assets. And firms are



dedicating much of their R&D budgets to reducing operating costs.

Of all the cost-efficiency levers, digitalisation is the one with the most remaining potential for oil and gas companies, says DNV GL. This became clearer than ever in 2020, when organisations were forced to accelerate their digitalisation in response to the pandemic. Out of necessity, many companies fast-tracked the adoption of

“For some, it's getting harder to squeeze any more water from the sponge.”

technologies that would normally have had to go through lengthy evaluation and testing processes.

Increasing the focus on digitalisation

Many survey respondents (71%) say that their organisation increased its focus on digitalisation over the past year, with nearly seven in 10 (68%) planning to increase their investment in digitalisation in 2021, and a further 25% maintaining current levels. Much of this is driven by a need to increase profitability (73%); 69% say that digitalisation is critical for their organisation's survival. “Some of the projects we aspired to do over the next two or three years have been brought forward quickly, because we simply had to do some of these things in 2020,” says John Morea, CEO of SGN. “It has really forced us to digitalise our business much more quickly than we probably would have done.”

The report highlights efforts to improve data management. Some 77% of MENA respondents say they are going to be working to improve data quality and availability in 2021, 12% up on last year. The top two digitalisation priority areas for 2021 – cloud-based applications and databases, and data collaboration platforms – are both related to this goal.

Significantly, the oil and gas industry is not hitting the spending brakes as hard as it did after the downturn in 2014. While the proportion of respondents expecting to maintain or increase capex in the year ahead has fallen to 62% – down from 72% going into 2020 – this is much higher than the 43% recorded following the last downturn. Nevertheless 44% of MENA respondents expect headcount to decrease, more than the global average.

The industry cut costs and waited for oil demand to rise during the last downturn, then renewed investment in oil and gas. While some in the industry are expecting a quick recovery, DNV GL research shows that most are looking longer term to transformational investments – to projects that will decarbonise the industry.

“Companies are betting long term when making transformational investments, aiming to navigate the multiple transitions taking place at different speeds around the world. While we see a crash in confidence for industry growth in 2021, we see growing confidence in the opportunities that lie in a decarbonised future,” says Danielsen.

“Much of the industry changed significantly in 2020,” adds Wendy Brown, IOGP. “In 2020 there was an increased focus on building a lower carbon future – one that can still meet global energy demand – and so decarbonisation has been pushed up the priority list for many oil and gas companies.” ■

Rystad forecasts 24% rise in global gas production to 2040

NORTH AMERICA, RUSSIA and the Middle East will account for the majority of global growth in natural gas production to 2040, according to new research from Rystad Energy.

Rystad Energy forecasts that global natural gas production will grow by 24% to 4,857 Bcm in 2040, with most additions coming from North America (+410 Bcm versus 2020 production), followed by Russia (+190 Bcm) and the Middle East (+185 Bcm).

US natural gas production could reach 1,194 Bcm in 2040, driven by output from Marcellus and the Permian. Shale production is however at risk due to the new government. Russia, Iran and Qatar can contribute with substantial output. Europe will be the only region to decline (-74 Bcm) due to lower production from Norway and the Netherlands.

Global natural gas demand is set to increase through 2040 by 26% to 4,867 Bcm, with Asian demand being by far the largest addition (+537 Bcm versus 2020), as gas is needed to power the region despite growth in renewables.

Environmental policies in Europe and growth in renewables will lead to a decline in demand from 2024, with the total demand losses on the continent to reach 43 Bcm in 2040, compared to 2020 demand. US demand is also at risk due to new environmental policies expected to be announced by the Biden administration.

Global liquefaction capacity is expected to nearly double by 2040, reaching a total of 886 million tpa, a 91% increase from 2020. With gas production growing the most in the US, its liquefaction capacity can continue to increase to 220 million tpa in 2040. The US is expected to be followed by Qatar with 124 million tpa, Australia with 96 million tpa and Russia with 70 million tpa.

The world's LNG production is expected to reach 672 Mt in 2040, a 79% growth from 2020 numbers. A spectacular rise in LNG production in the US is expected (+203 Mt for the whole of North America) as gas production grows but domestic demand growth is limited. Qatar will continue to be a key LNG player driving Middle Eastern exports, while Mozambique will help put Africa back on the LNG map. However, more LNG production is needed to keep up with demand.

Far exceeding production, the need for LNG imports is expected to grow to 736 Mt in 2040. Due to limited domestic production, Asia will absorb most of the growing LNG supplies to fuel its increasing power demand. China, India, Pakistan, Thailand and Bangladesh in particular will drive the growth.



The Middle East will make a significant contribution to the growth of gas production to 2040.

Image credit: Adobe Stock

2021 a “defining year for gas”

2021 WILL BE a defining year for the gas and LNG industry, says Wood Mackenzie in its latest outlook report. The report identifies five themes that will impact the industry this year:

- The acceleration in coal-to-gas switching is a key theme to watch in Asia, as coal accounts for more than 50% of the region's energy mix. In Europe, additional coal plant retirements in Germany and Poland could support more gas utilisation in the medium term. Additionally, firm policies in support of CCUS as well as blue hydrogen, would support gas demand in hard to decarbonise sectors.
- Players across the gas value chain have announced proposals for the development of large-scale CCUS projects to decarbonise localised industrial clusters and/or to use in combination with steam methane reformers (SMRs) to produce blue hydrogen from natural gas. New momentum is building up for CCUS for industrial and power plants too. Public support and regulation, as well as new business models, have all been key to support recent developments.
- President Biden has announced a US\$2 trillion ‘clean energy revolution’ seeking to accelerate the US energy transition, including a US return to the Paris Climate Agreement. If implemented, these policies could have long-term effects on the US energy landscape.
- Despite global LNG supply expected to increase by 17mn tonnes (Mt) in 2021, the current cold spell in the northern hemisphere is paving the way for a tighter global gas market throughout the year. In 2021, Wood Mackenzie anticipates TTF averaging US\$5.6/mmbtu and Asian LNG spot averaging US\$7.6/mmbtu.
- Buyers will be looking to assess their portfolio requirements and how comfortable they are in committing for new long-term firm LNG vs increasing their spot market exposure. They might start questioning Qatar's commitment to quickly move forward with its 32 mmtpa North Field East project, following continued delays. The market will need around 85 mmtpa of new LNG supply by 2030. Provided Qatar takes FID early this year, most buyers will be in no rush to secure more long-term supply. A buyer's market remains despite the current winter Asian LNG spot price spike. However, further delays to Qatar's FID will push some buyers to look for new long-term commitments.

Role of gas in energy transition highlighted

MAJID JAFAR, CEO of Crescent Petroleum and managing director of the board of Dana Gas, has highlighted the critical role gas can play in energy transition strategies as governments look to reduce their carbon footprint and recover from the economic impacts of the COVID-19 pandemic.

Jafar's remarks, made at a panel session at the Atlantic Council Global Energy Forum held virtually from 19-21 January, were reported by the Emirates News Agency.

As countries commit to more ambitious decarbonisation goals while seeking to boost economic activity in the wake of the pandemic, natural gas offers a reliable and lower carbon solution for developing countries with growing energy needs as they move away from coal and seek to complement renewable energy, Jafar said.

“As economies around the world look to emerge from the economic impact of the COVID-19 pandemic, cleaner burning natural gas will offer the multiple benefits of affordability, reliability and lower carbon footprint, while serving as a critical counterpart to intermittent renewable energy, while also enabling tomorrow's hydrogen economy,” Jafar is reported to have commented. “Countries looking to boost infrastructural spending in the wake of the pandemic must consider a future energy strategy with natural gas as an important part of the mix, particularly in the developing world where coal is the main energy source but also the single biggest source of CO₂ emissions, as well as particulates and nitrous oxides.”

He added that the oil and gas industry will need to focus on preventing methane leaks in their operations, minimising gas flaring, and adopting new technologies such as carbon capture and storage and methane emissions abatement to ensure a reliable and cleaner gas supply.

He noted that the UAE's Energy Strategy for 2050 envisages that gas and renewable energy will each provide around 40% of energy needs.

Rethinking the status quo of energy projects

Badar Chaudhry, senior vice president, unit manager, energy sector at Mashreq Bank argues for a circular economy approach to reduce the risk of stranded assets.

A CONSTANT RUSH TO build as much infrastructure and curate as much talent as possible is a narrative that has long pervaded the fossil fuel boom. But the energy transition – especially its surprising acceleration over the last year – is changing that. Now the burgeoning push to find project financing for new types of greener energy projects and innovations, notably renewables, nuclear and liquified natural gas (LNG), is raising a very pressing question. How to avoid a potentially financially crippling surge in stranded fossil fuel assets, notably coal and oil?

A US\$900bn red flag

The cost of writing off stranded assets could reach \$900bn worldwide – or one third of the current value of big oil and gas companies – if governments aggressively tried to meet the limit of 2°C, according to the Financial Times' Lex. Consider the financial burden of this figure amid lower oil prices, the economic strain of the COVID-19 pandemic, plus the cost of the energy transition. Wood Mackenzie forecasts a minimum of US\$30-US\$40trn of investment is needed to put the world on a 2°C or lower pathway.

Of course, the potential financial strain will differ from region to region. For example, oil and gas will remain a central part of the Middle East's energy basket up to 2050. This is not a failure, but key to sustaining energy security as the world finds its greener footing. That the 'last drop of commercial oil' will very likely be from a Middle Eastern well reduces the region's immediate risk of stranded assets, but the risk must still be factored in as the renewable portfolio matures. The combined shares of oil and gas as part of the region's energy mix will fall from 98% in 2018 to 61% in 2040 with a Rapid scenario, 37% in a Net Zero scenario, and 79% in a Business as Usual (BAU) scenario, according to BP's Outlook.

Choose your path: business as usual or a proactive approach?

So, how to mitigate the risk of losing the billions of dollars invested in existing fossil fuel infrastructure, much of it based on multi-decade contracts and multi-decade debt packages? One route is to continue business as usual and risk the hyperbole image of stranded assets – a bleak landscape with rusting infrastructure en masse creaking in the wind – becoming an expensive reality in the next few decades.

Another route is one of proactivity, which sees legacy infrastructure getting a reboot to make it more aligned with the Paris Agreement goals. Broadly speaking, this means embracing a circular carbon economy (CCE), which in turn, includes bolstering energy efficiency within legacy infrastructure, updating skillsets, and applying the digital tools of the 4th Industrial Revolution (4IR) to help maximise value and relevance.

“The value of a circular carbon economy goes far beyond ticking sustainability boxes in the energy transition.”

Best chance at stabilising elements of climate change

This is an undeniably vast and complex task, but it is our best chance at stabilising the environmental and economically human-induced elements of climate change. Improving energy efficiency and switching to renewable energy will address 55% of global greenhouse gas (GHG) emissions, detailed the Ellen McArthur Foundation. But by adopting circular practices, the world can reduce a significant proportion of the remaining 45%.

The systems-based approach of a circular

carbon economy combines economic opportunity with better environmental and societal outcomes by addressing the multitude of facets of the energy transition – i.e. water scarcity, loss of biodiversity, packaging pollution and more. All parties in all industries must zoom their lower carbon microscopes on their supply chains – both linear and interconnecting – to redefine environmental efficiency from production through to the end user. And back again. Climate finance plays a vital role in this positive disruption, starting with educating stakeholders about what greener finance means and how to leverage it.

Plus, the price tag of this route is far less than that of stranded assets or the catastrophic impacts of unmitigated climate change. Payback margins are increasingly appealing in today's economic environment. For example, the Global Commission on Adaptation (GCA) calculated that every dollar invested in building climate resilience could result in between US\$2-US\$10 in net economic benefits.

Domino effect

Let us not forget that the value of a circular carbon economy goes far beyond ticking sustainability boxes in the energy transition. It also directly links to lower resource scarcity and geopolitical tensions. The Ecological Threat Register 2020 results show that 141 countries are exposed to at least one ecological threat between now and 2050. The 19 countries with the highest number of threats have a population of 2.1bn. This means a minimum of 20% of the global population would be significantly affected by mid-century.

The economic fallout alone of this global ricochet of disruption – something the world has already witnessed with COVID-19 – would be life-changing for many more billions of people. We have the solution for reducing the risk of stranded assets via a circular carbon economy at our fingertips. Now we just need to proactively reach for it. ■

Rig count reveals impact of COVID-19 pandemic

Middle Eastern and international rig counts have plummeted since the spread of COVID-19, says Robert Daniels.

IT HAS BEEN repeated often enough, but remains true, that at the beginning of 2020 few people could have predicted the deep impression that COVID-19 would have on every person around the globe. In terms of economics, there were few sectors that did not suffer, and while there are tentative signs of recovery the scars of the past year will remain for a long time yet.

This is no clearer than in the oil and gas industry. With a sudden sharp decline in travel, construction and energy usage, oil demand and its price plummeted. According to research undertaken by Banker, between February and November 2020 the OPEC basket dropped by 30.65%, falling to a low of US\$14.19 on 20 April. It is no surprise, therefore, that the international rig count reflected this.

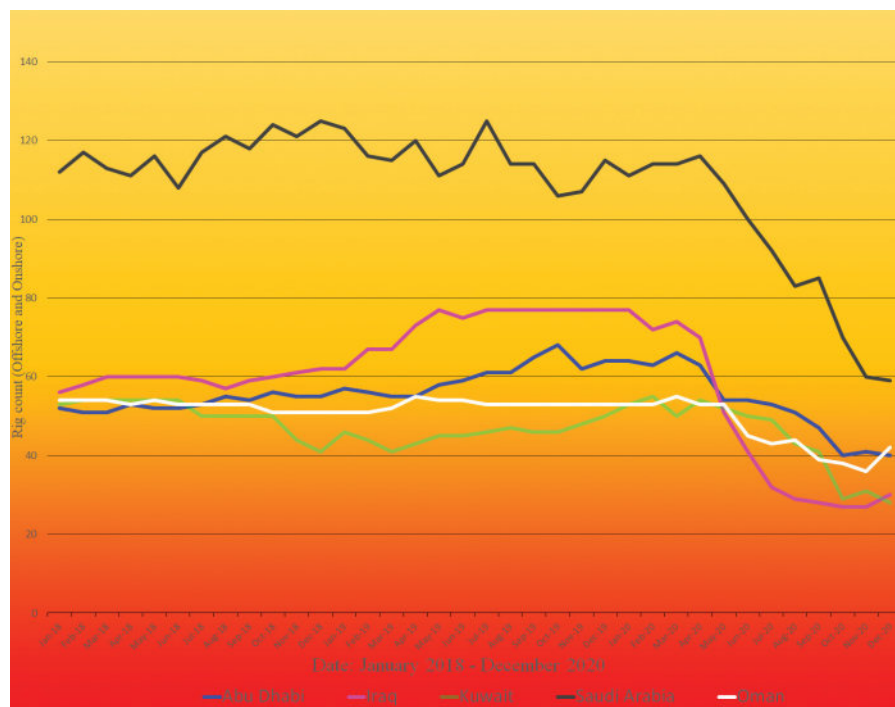
The international rig count decline

In December 2019, according to data collected by Baker Hughes, the global rig count including both onshore and offshore facilities stood at 2043. By February 2020 this had increased to 2,125 before plunging once the pandemic began to take effect in April. In December, the global rig count stood at just 1,104, a little over half of the count at the same time the previous year.

Over the last few years, the increased emphasis on climate change has resulted in customer demands changing to focus on clean fuel and renewable energy sources over hydrocarbons. This has led to a steady decline in global rigs under operation since 2014 but, despite this, last year was still an unprecedented year for the oil and gas market: since the Baker Hughes database began, in 1975, the rig count of 1,016 in October 2020 is the lowest ever recorded.

The Middle East

This trend has been matched in the Middle East, with operational rigs in the region falling from 430 to 242 from December 2019 to December 2020, a drop of 44%. While this is not as steep as some regions



Rig count of major oil and gas producers in the Middle East. Data collected from Baker Hughes' International Rig Count.

(the USA suffered a decline of 58%), it is still greater than Europe (30%), Asia Pacific (27%), Canada (26%) and Latin America (43%).

Of the major gas and oil producers in the Middle East, between December 2019 and December 2020, Iraq's rig count fell by 61%, followed by Saudi Arabia (49%), Kuwait (44%), Abu Dhabi (38%), and finally Oman (21%).

“It remains to be seen whether the rig count will, perhaps ever, return to its pre-COVID-19 levels.”

Will the rigs return?

There have certainly been promising signs from the industry in recent months. OPEC+, anticipating a return to normality with the incoming vaccines, has announced its intention to increase oil production by 500,000 bpd in January. Additionally the IEA has forecast that 2021 oil consumption, while not returning to pre-downturn levels, could rebound to increase by 5.96 mnb/d. IHS Markit has predicted that by early 2022 there could be a near-full recovery, which will almost certainly lead to many rigs returning to operation.

However, with governments, consumers, investors and industry leaders seizing the opportunity to reinforce their commitments to green targets, it remains to be seen whether the rig count will, perhaps ever, return to its pre-COVID-19 level. ■

The current Middle East jackup market

AS WITH ALL of the oil and gas industry, the jackup rig market suffered in 2020 as COVID-19 drove down tourism, travel and industrial labour, causing the demand for hydrocarbons to suddenly, and sharply decline. Terry Childs, head of Riglogix at Westwood Global Energy Group, a leading market research provider, has issued his insight on the present state of the jackup market in the Middle East and considered how COVID will continue to effect the industry moving into 2021:

Comprising the Arabian/Persian Gulf and Red Sea/Gulf of Suez offshore Egypt, the Middle East rig market has the largest jackup supply and demand in the world, and by a long way. At the end of 2020, there were 168 jackups in this region, with the next most populated – China – having 62 units in its fleet. The majority of rig supply in this area is located offshore Saudi Arabia and the United Arab Emirates (UAE), with those two areas accounting for 52 and 50 jackups, respectively. The bulk of the remaining rigs are in Qatar (23) Iran (17) and Egypt (15). These five countries combined make up 157 of the 168 total jackups in the region.

Jackup utilisation

As of January 1, 2021, utilisation stood at 76%, with 128 working or under contract. The marketed fleet, which excludes cold stacked units, totals 150, putting utilisation at 85%. Of all the regions in the world with more than 10 commercially available jackups, only Mexico has a better utilisation (2% higher), but supply there is only 29% of what it is in the Middle East.

Utilisation here was the least impacted in the market created by COVID-19 and lower oil prices, falling only by 3% between March and September 2020 before starting an increase that pushed rig usage in December to its highest level of the year. This was achieved despite the fact that 16 contracts were suspended by operators. However, where many contracts in other regions were terminated, these rigs remained under contract, albeit at greatly reduced or even zero dollar day rates. Nevertheless, there was around US\$430mn of lost revenue for rig owners, the second-most globally behind only the North Sea.

Despite the high marketed utilisation, day rate fixtures here have not increased, with some deals offshore Egypt, for instance, well below US\$40,000. In addition, many existing contracts, those that were not suspended, saw downward rate adjustments, generally in the 5-10% range.

Promising signs

One bit of good news in this region is that in December four jackups that were under one-year contract suspension from Saudi Aramco returned to work. All of the contract suspensions from the operator came with the proviso that the lost days would be added to the back end of the contract, resulting in no net lost days by any rig owner. Also, in late December, ADNOC Drilling completed the purchase of a jackup from Shelf Drilling, the



Image Credit: Westwood Global Energy Group

Terry Childs, head of Riglogix, Westwood Global Energy Group.

first of a reported 10 the ADNOC Offshore drilling offshoot is said to be looking to purchase.

Looking ahead

In 2021, there could be additional suspended jackups returning to work, but there are also reports that new contract suspensions may take place. What ultimately happens will depend on whether previously eased COVID-19 travel restrictions continue and whether oil prices remain stable or increase.

Day rates in 2021 are not expected to increase, at least in the first half of the year, but should utilisation continue at 85% or higher, it could result in some increases later in the year. Operators here still have over 12,000 days of potential work from rig requirements and coupled with the large percentage of contract extensions that occur here, this region will continue to dominate global jackup activity in the future.



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Throughout 2020, 47 crude oil and 15 natural gas reserves were found across Egyptian territory.

Egypt's oil and gas industry resilient as other sectors stutter

Exploration activities are paying dividends and are key to Egypt's oil and gas expansion, says Robert Daniels.

AFTER A CHALLENGING 2020, Egypt's non-oil sectors have deteriorated as the pandemic continues to wreak havoc on the economy. However, the oil and gas industry has seen a flurry of positive activity in the new year, following positive developments in 2020, which have served to spark hope for its future security and growth.

As COVID-19 cases in Egypt continued to rise at the end of 2020, non-oil businesses witnessed a decline in operating conditions, reflecting falls in both output and new orders as client demand was reduced, according to an IHS Markit report. The IHS Markit Egypt Purchasing Managers' Index, a composite gauge to provide a snapshot of operating conditions, registered 48.2 in December, below the 50.0 mark, indicating moderate deterioration of the non-oil sector. The report also noted that employment cuts accelerated at the fastest rate seen in four months.

While other sectors were struggling, the Egyptian oil and gas sector marked the turn of the year with a spate of positive announcements, encouraging expansion and development.

Exploration in the Mediterranean and Red Sea

The Egyptian Ministry of Petroleum and Mineral Resources announced a minimum investment of US\$1.4bn to search for petroleum and natural gas. International and Egyptian companies including Total, Shell, Tharwa, Chevron, Kuwait Foreign Petroleum Exploration Company (KUFPEC), and ExxonMobil Egypt have signed 12 agreements to drill in 23 separate locations across nine regions in the Mediterranean Sea, and three in the Red Sea.

One such area is the North Ras Kanayis Offshore block, located in the Herodotus Basin, which covers an area of 4,550 sq. km, extending 5-150 km from the shore with water depths ranging from 50-3,200 m. Total is leading a consortium to explore the block, which will consist of a 3D seismic campaign being carried out within three years.

“We look forward to the drilling of further wells as part of our 2021 campaign.”

Also scheduled to be explored further is the Red Sea Block 4, which has an area estimate of 3084 sq. km. The block is located in an area adjacent to the prolific Gulf of Suez basin and is owned by the South Valley Egyptian Petroleum Holding Company. The Egyptian Ministry of Petroleum and Mineral Resources signed the concession agreement with Mubadala Petroleum for oil and gas exploration in the block which is operated by Shell.

Eni discovery in the Western Desert

This fresh phase of exploration came soon after Eni announced the successful discovery of oil through the Arcadia 9 well in the Western Desert. Drilled on the Arcadia South structure, located 1.5 km south of the main Arcadia field already in production, the well encountered an 85 ft oil column in the Cretaceous sandstones of the Alam El Bueib

3G formation. Following this discovery, two further development wells, Arcadia 10 and Arcadia 11, have been drilled, both of which also encountering respective oil columns. The new discovery will add 10,000 bpd to Eni's gross production in the Western Desert.

United Oil and Gas PLC spudding commences

Also targeting the Alam El Bueib reservoirs at a depth of 3,600-3,950 m, the United Oil and Gas PLC has begun spudding the ASH-3 vertical well. This comes with high hopes after the ASH-2 production well, which came onstream at the beginning of 2020, has produced more than 1mn bbl to date, with current rates of 4,500 bpd. The CEO of United Gas and Oil PLC commented,

“It is equally pleasing to be back drilling in Egypt again, after the deferral of the majority of the 2020 drilling programme due to the low oil price environment, and we look forward to the drilling of further wells as part of our 2021 campaign.”

The ability of the Egyptian oil and gas market to buck the trend of economic decline has been particularly reflected in its continued success with oil exploration. The Egyptian Ministry of Petroleum and Mineral Resources reported that throughout 2020, 47 crude oil and 15 natural gas reserves were found across Egyptian territory, which amounted to a 13% rise in the discovery of oil compared to the previous year.

While other sectors in Egypt are clearly struggling with the effects of the pandemic, it appears the oil and gas industry is seeking, instead, to expand production and bolster profits, with a corresponding positive impact on Egypt's economy and its ambitions to become a regional energy hub. ■

The outlook for the oil and gas shipping market

Tanker owners are looking to the second half of 2021 for recovery after a distraught year, says Charlotte Bucchioni, associate editor, Dirty Tankers, S&P Global Platts EMEA office and Wyatt Wong, editor, LNG Shipping, S&P Global Platts London office.

TANKER OWNERS' EARNINGS remained depressed in the fourth quarter of 2020 as a result of pandemic-related demand destruction. With the crude oil market structure shifting to backwardation, disincentivising holding oil in storage, vessels that were on charter for floating storage from earlier in the year returned to the market. This caused an influx of tonnage into an already oversupplied market and weighed heavily on rates.

The outlook for 2021 is for a gradual improvement in freight rates on the back of a 3.8mn bpd increase in global liquids demand, according to S&P Global Platts Analytics, but that recovery is set to be weighted towards the second half of the year, and tanker oversupply is expected to be a drag on the recovery for vessel owners.

Demand from Asia is currently the only real support for the market, and with the coronavirus resurgent in other regions, it is a case of waiting for vaccination rollouts to translate into an increase in demand that will clear the excess supply of ships.

On the VLCC route from the Middle East to China, freight rates have been stuck in the doldrums since July, with daily earnings not even covering operational fixed costs for most fixtures. Although rates recovered slightly towards the end of the year on the back of stronger buying interest from China, Saudi Arabia's surprise announcement of a unilateral 1mn bpd production cut until Q2 and lags in crude demand recovery are likely to pressure earnings below operational fixed costs until the end of the summer, according to data from S&P Global Platts Analytics.

Rates on the Persian Gulf-to-China VLCC run averaged just US\$7.61/mt in December, according to Platts assessments, or a decrease of 64% compared with December 2019, when freight averaged \$21.15/mt.

There have been fewer than 100 VLCC spot fixtures a month for crude loading in the Middle East for the last few months, according to shipping industry estimates, down from more than 150 each month before the crisis.

High oil inventories are also keeping a lid on any meaningful recovery in freight as Chinese buyers filled onshore storage facilities through 2020, taking advantage of low prices. Market participants are expecting the bearishness to largely roll over into the first half of 2021, but with some potential for occasional rallies as the unusual market situation creates uncertainty among owners about where to position vessels, which could result in tight availability in some regions at points.

For example, in January, a combination of robust demand for naphtha and thin tonnage lists for Long Range vessels pushed freight rates to a three-month high for LR1 tankers on the Mediterranean-to-Japan run.

Upward expectations for Iranian exports, uncertainty around Libya

Middle Eastern export routes could see a significant increase from Iran if the USA, under new President Joe Biden, eases sanctions with a view to resurrecting the nuclear deal that President Trump pulled out of



Image Credit : Adobe Stock

in 2018. Iran's leaders have already ordered its oil sector to prepare to ramp up production and exports, and Platts Analytics forecasts 160,000 bpd year-on-year volume growth in 2021, with "significant upside risk of a speedier return".

In North Africa, the outlook for Libya – which remains exempt from OPEC+ production cuts – is also highly uncertain after wild swings in output in recent years. Following the lifting of a nine-month oil blockade, Libyan exports surged to 1.24mn bpd in December from less than 100,000 bpd in September. However, a comprehensive solution to the political strife that has beset the country over the past decade still looks some way off. On top of this, earlier this month there was a reminder of the dilapidated state of the country's oil infrastructure after years of fighting and neglect, with the shutdown of a pipeline to the Es Sider terminal for two weeks of urgent maintenance shutting down 200,000 bpd of output.

Pacific gas freight rate supported by Atlantic market

In the spot LNG shipping market, sentiment was bullish at the start of 2021. The Atlantic shipping rate doubled from US\$105,000/day at the end of November to reach an all-time high of US\$300,000/day on 8 January.

The strength in the spot market was underpinned by low supply, and high demand due to a wide-open arbitrage to send Atlantic cargoes to the Far East, where spot LNG prices have reached all-time highs above US\$30/MMBtu. The Pacific market drew support from the surge in the Atlantic market and rose from US\$100,000/day to US\$175,000/day from 30 November to 8 January, rising 75%. This was near levels last seen in the end of Q4 2018, which peaked at US\$190,000/day.

However, this may ease off as we move further into Q1 2021, with the arbitrage window narrowing or closing due to lower LNG prices for March and April delivery. ■

Succeeding in the Middle East with a collaborative approach

In a wide-ranging interview, Weatherford's new CEO Girish Saligram speaks to Oil Review Middle East about the company's strategy, technology trends, and Middle East operations.

OILFIELD SERVICES COMPANY Weatherford, along with its industry counterparts, faces an uncertain oil market environment as it enters a new year.

One thing that is certain, however, is the enduring strategic importance to the company of the Middle East, where it has had a longstanding presence and enjoys a strong share position.

"Weatherford has a rich and deep history of involvement in the Middle East, going back decades," explains Saligram. "We have had a joint venture in Saudi Arabia for more than 40 years, for example. It's a testament to our commitment to the region and our customers, as well as the deep relationships we have fostered, leading to mutual success."

Safety and integrity, quality, and increasing efficiency of overall operations are priorities for customers in the region, he says.

"Our strategy as a service provider is to bring the most differentiated and best technology, coupled with the deep expertise we have on the ground and the relationships we have built up, to deliver the strongest solutions for our customers.

"We aim to differentiate ourselves and enhance our customer relationships with technology that optimises their hydrocarbons resources and production with the highest level of safety and efficiency. These benefits ultimately result in a stronger value position for them. Adding operational value is the way to continue to foster relationships. Our customers recognise that, as illustrated by our continuing strong presence in the region."

Weatherford's strong technology portfolio, coupled with its service capability, enable it to

address the technical challenges faced by Middle East operators throughout the region, such as increasing gas production, addressing high levels of water cut, and a growing focus on unconventional, where the company is drawing on its North America experience and applying technologies developed in the U.S. market.

Helping the region to address its localisation and workforce challenges is another priority for Weatherford, working closely with operators, and this pays dividends for both sides.

"We have growing local teams throughout the GCC countries, which is an important factor for them as well as for us. We focus on recruiting and retaining local talent to work effectively and safely in the country and understand our customers. The second aspect is the investment in local capabilities, such as our manufacturing facilities in Abu Dhabi and Saudi Arabia."

"In this way, we give back to the local economies and communities. It also helps us bring in great local talent that grows through the company and rises to leadership positions. It's a virtuous cycle; as long as we nurture it, it pays dividends."

Relationships are key at all levels. "We have the relationship that starts at the operational level in the field, emphasising our core value partnership and collaboration. We connect with customers, understand their needs, and act as partners and collaborators to find solutions. At the leadership level, we have regional leaders who live and work in these markets, building strong and effective relationships with the leadership teams of the NOCs, the independents, and the and IOCs. So, it's a multifaceted relationship, and we augment that through the global corporate relationships we have through our headquarters in Houston."

Technology strategy

Turning to technology development, Saligram explains that the company's strategy is to work closely with customers to find solutions



Girish Saligram,
CEO, Weatherford.

Image Credit: Weatherford

to their problems and then roll out these solutions globally. He adds, "The Middle East has always embraced new technology, and the company has successfully deployed technologies in the region that have acted as pilots for different applications."

"Our Foresite production optimisation platform is one such example," he says. "We have deployed this in the region with many operators. It allows customers to enhance the life and production of the well significantly."

The Foresite platform allows operating companies to capitalise on in-depth asset data analytics and make proactive decisions to maximise production. It processes real-time sensor data from every corner of an asset to provide a clear analysis of the reservoir, well, field, and surface network, while continuously updating engineering models and leveraging predictive analytics to help the user evaluate, predict, and respond to ever-changing conditions. "The technology has resulted in huge savings worldwide; a customer in Indonesia, for example, saw a 40% increase in uptime and a corresponding increase in production after deploying the solution," Saligram says.

"It's a great example of bringing new technology together with deep domain

“ We have had a joint venture in Saudi Arabia for more than 40 years.”

expertise, coupled with intimacy with customers, resulting in a more effective solution,” he comments.

Other technologies Saligram highlights are the Vero automated connection integrity system, which fundamentally changes the tubular-running game from an automation standpoint.

“It changes the way we manage operations, increasing efficiencies and safety through automation. The TR1P system is the first and only remote-activated, single-trip deepwater completion system. And, the Magnus rotary steerable system is gaining traction in the region.

“We have a history of commercialising technology, but ultimately it comes back to the need for technology to deliver value, through a combination of differentiation in the platform, with customer intimacy and service delivery.”

The use of data is a prime example of the two-way collaboration with the customer. “In the case of our Foresite platform, for example, we can gather the customer’s data and help them optimise their production using our propriety algorithms. You can take data across an entire series of wells, across various systems; the platform is entirely agnostic where equipment or controllers are concerned. We can conglomerate all that data together, and through these proprietary algorithms, we can make recommendations on how to improve operations and change specific parameters to increase production. That’s a great example of helping customers to monetise their data.”

Saligram cites remote operations and automation as examples of enabling safer and more efficient operations, which have come to the fore in the pandemic.

“One of the side effects of the pandemic has been the acceleration of the adoption of technology to improve collaboration and remote operations,” he says. “In our industry, there are two central notions – the first is safety, which is of paramount importance, and the second is the reliance on people on the ground. That’s an inbuilt paradox as the best way to improve safety is to take the human out of the equation to a certain extent or keep them at a safe distance. The pandemic has allowed us to deploy solutions that achieve that faster, in collaboration with customers. This will be a paradigm change going forward.”

Saligram mentions that the company’s proprietary AccuView remote-support system allows well construction experts to be called upon to help people on the ground remotely, eliminating the need for them to travel to the site. In this context, he again mentions Vero automated connection integrity, which uses artificial intelligence and evaluation software to verify a connection’s integrity, thereby removing the need for human involvement in an inherently unsafe operation. Another



Image Credit: Weatherford

Vero automated connection integrity applies artificial intelligence to eliminate errors or oversights in tubular running that can lead to safety incidents and costly remediation.

example is the Victus intelligent MPD system, “another great combination of automation coupled with domain expertise.”

“All these factors are leading towards a fundamental inflection point in the industry where the combination of remote operations, automation, and artificial intelligence converge to give us the ability to change the cost paradigm, while at the same time having a positive impact on safety,” Saligram remarks.

Embracing the energy transition

The energy transition and addressing climate change is another area that has come to the fore for oil and gas companies – and Weatherford is wholeheartedly embracing it. Saligram sees a vital role for the company in increasing the sustainability of existing operations and the broader diversification of the energy system.

“The energy transition and energy diversification is a reality; we have to meet it head-on, face the challenges and play an active part in it. While there is strong growth in alternative energy forms, hydrocarbons will continue to account for a significant portion of the world’s energy supply for some time to come. What we have to do is help our customers, the operators, find more sustainable ways of driving that production.” Reducing existing operations’ carbon footprint is an integral part of this, from reducing personnel on board and miles driven to single-trip completions, which help operators drill wells more efficiently in less time.

“Production optimisation is a huge factor in improving the sustainability of operations, because the more you can produce from a given well, the more value you can get from

it and the more it reduces the need for further drilling.”

When it comes to the energy transition itself, Saligram underlines that Weatherford has the tools and technology that can play a role in carbon capture utilisation and storage (CCUS) and is exploring opportunities with customers for converting existing wells for storage and monitoring the gases once in the well. The company is also exploring opportunities in renewables, in particular geothermal. “We bring technology such as managed pressure drilling, tubular running, and wireline completion services into that particular form of energy,” he says, adding that Weatherford continues to explore ways of deploying its capabilities as the energy transition unfolds.

Concluding, Saligram returns to the theme of production optimisation and the revitalisation of mature fields, which is a strong focus in these cost-constrained and uncertain times. “If you can revitalise an existing field and get more production out of it, it reduces the need to start another project or spend more elsewhere. So it is clearly an important theme, and we have a great portfolio that’s well suited to deliver. Our ability to do intervention on these wells makes a big difference, and we gain credibility by working with customers through the lifecycle of their operations.

“To a certain extent, the world is in flux right now. However, a theme here to stay is getting the most out of existing assets, along with an emphasis on lower-cost paradigms that still give you the same, if not higher, degrees of safety. An existing field, brownfield, or revitalisation presents a lower risk on all of those fronts, so that’s a theme that will gain traction as we come out of this pandemic.” ■

Reducing methane emissions in the oil & gas industry

The International Energy Agency (IEA) has released new data and analysis on methane emissions, along with policy guidance on methane emissions regulation.

REDUCING METHANE EMISSIONS from oil and gas operations is among the most cost-effective and impactful actions that governments can take to achieve global climate goals.

Methane is a much more potent greenhouse gas than carbon dioxide (CO₂) and makes a major contribution to global warming. According to the IEA's 2021 update of its Methane Tracker, <https://www.iea.org/reports/methane-tracker-2021>, oil and gas operations worldwide emitted more than 70 million tonnes of methane into the atmosphere last year, just over 5% of global energy-related greenhouse gas emissions.

Methane emissions from the global oil and gas industry fell by an estimated 10% in 2020 as producers slashed output in response to the historic shock of the Covid-19 crisis, according to the International Energy Agency, which warns that these emissions could rebound strongly without greater action by companies, policy makers and regulators.

The new IEA analysis indicates that a large part of the drop in methane emissions in 2020 occurred not because companies were taking more care to avoid methane leaks from their operations, but simply because they were producing less oil and gas. As such, there is clearly a risk that this downward trend will be reversed by an increase in production to fuel a rebound in global economic activity.

"The immediate task now for the oil and gas industry is to make sure that there is no resurgence in methane emissions, even as the world economy recovers, and that 2019

Total methane emissions and methane intensity of production in selected oil-producing countries, 2020

	Total methane emissions (Mt)	Methane intensity (tCH ₄ /ktoe)
Russia	13,952.8	13.1
USA	11,790.2	8.0
Iran	5,256.7	16.3
Turkmenistan	3,916.2	47.4
Iraq	3,354.5	15.5
China	3,150.4	9.2
Algeria	2,592.1	18.0
Libya	2,490.7	103.0
Venezuela	2,397.9	48.0
Canada	1,954.6	5.0
Saudi Arabia	1,828.3	3.0
Nigeria	1,393.0	10.9

Source: IEA

becomes their historical peak. There is no good reason to allow these harmful leaks to continue, and there is every reason for responsible operators to ensure that they are addressed," said Dr Fatih Birol, the IEA executive director.

"Alongside ambitious efforts to decarbonise our economies, early action on methane emissions will be critical for avoiding the worst effects of climate change. There has never been a greater sense of urgency about this issue than there is today," said Dr Birol.

IEA analysis highlights that reducing methane emissions is very cost-effective for oil and gas companies. Unlike CO₂ there is already a price for methane everywhere in the world – the price of natural gas. This means the costs of improving operations or making repairs to prevent leaks can often be paid for by the value of the additional gas that is brought to market.

"We believe that industry must act, visibly and quickly," Dr Birol said. "But there is also a strong role for government policies; to incentivise early action by companies, push for transparency and improvements in performance, and support innovation in getting results."

"One important avenue, especially for

countries with large oil and gas sectors, will be to include commitments on methane in their new or updated pledges in advance of the COP meeting," said Dr Birol. "This is also the moment for companies to put all their weight behind this effort."

Regulatory roadmap and toolkit

To accelerate methane reduction efforts, the IEA has released a new report, *Driving Down Methane Leaks from the Oil and Gas Industry: A Regulatory Roadmap and Toolkit*, <https://www.iea.org/reports/driving-down-methane-leaks-from-the-oil-and-gas-industry>, which offers a step-by-step guide for developing or updating methane regulation. Its advice draws on analysis of how more than 50 countries, states or provinces – from the USA to Nigeria, from Iraq to China and Russia – have tackled methane emissions from a regulatory perspective.

The IEA identifies ten steps that will assist regulators in selecting a regulatory approach and implementing a set of effective methane policies that match the local situation. These are: understand the legal and political context; characterise the nature of your industry; develop an emissions profile; build regulatory capacity; engage stakeholders; define

“Early action on methane emissions will be critical for avoiding the worst effects of climate change.”

regulatory objectives; select the appropriate policy design; draft the policy; enable and enforce compliance; and periodically review and refine your policy.

Policy and regulation can help countries meet emissions goals, but there are no one-size-fits-all solutions, the IEA points out. Different approaches have different advantages and disadvantages depending on the circumstances. In particular, the effectiveness of a policy provision may depend on the range of existing administrative authorities and regulatory capacity, the nature of the industry and the local emissions profile.

Better information can enable more efficient regulatory requirements, but developing and implementing a robust measurement and reporting regime may take several years. For jurisdictions in the early stages of regulating methane, prescriptive standards may be the best option until a robust measurement and reporting regime is in place, the IEA advises.

Abatement measures

A wide variety of technologies and measures are available to reduce methane emissions from oil and gas operations. The options deployed vary by country, depending on the prevailing emissions sources, gas prices and capital and labour costs. The IEA Methane Tracker highlights abatement technologies as follows:

Replacing existing devices: Many pieces of equipment in the oil and natural gas value chains emit natural gas in their regular course of operation, including valves, and gas-driven pneumatic controllers and pumps. Retrofitting these devices or replacing them with lower-emitting versions can reduce emissions. For example, pneumatic pumps that use pressurised natural gas as a power source can be replaced with electrical pumps powered by solar or other generators, or connected to the grid. An electric motor can also replace a diesel or gas engine used onsite during drilling and well completion. Pumps and controllers that vent natural gas can be replaced by instrument air systems, which pressurise ambient air without emitting methane.

Installing new emissions control devices: There are a number of opportunities across the supply chain to install new devices that can reduce or avoid large sources of vented emissions:

Vapour Recovery Units (VRUs): VRUs are small compressors designed to capture emissions that build up in pieces of equipment across the oil and natural gas supply chains. For instance, VRUs can capture gases that accumulate in oil storage tanks and that are otherwise periodically vented to the atmosphere to prevent explosion.

Blowdown capture: Gas blowdowns are



Image Credit : Adobe Stock

Satellites are playing an increasing role in tracking methane emissions.

conducted at wellheads or elsewhere along the supply chain when equipment (e.g. vessels, compressors) must be depressurised. Blowdowns can be triggered by emergency signals or routine start-up or shut-down procedures. When this happens, operators open up the well to remove the liquids and gas. Emissions are mitigated when excess gas is recovered and used onsite or sent to the sales line, instead of being vented or flared.

Install flares: While still a source of CO₂ and methane emissions, flaring is preferable to direct release of the methane gas to the atmosphere, says the IEA.

Install plunger: Periodically over the life of a producing well, downhole liquids need to be removed to facilitate continued flow of product (often called 'liquid unloading'). Traditionally, a well operator opens the well and vents methane, relieving pressure and drawing liquids up through the wellbore. Plunger lifts may be installed to extract liquids more efficiently, while limiting the escape of methane.

Leak detection and repair (LDAR): Many existing methane abatement policies include a leak detection and repair (LDAR) regime, directing companies to inspect and repair leaking equipment at regular intervals. One common approach is the use of infrared cameras, which make methane leaks visible. LDAR can be applied across the supply chain.

Alternative and innovative technologies: New approaches are being developed, such as installing methane-reducing catalysts; deploying microturbines or other technologies that allow for local productive use of

associated gas in remote locations; conducting a pipeline pump-down before maintenance; and reduced-emission or 'green' completions.

Improving methane data

Monitoring, reporting and verification are key supporting elements of regulations, says the IEA. Much greater transparency is coming on methane emissions, thanks to new ground-based and aerial measurements. The increasing availability and accuracy of satellite data is set to be an important part of this process. There are various satellites in operation today that can provide estimates of the atmospheric concentration of methane across different geographic areas. Globally, around 5.5Mt of methane emissions were detected by satellites in 2020, according to the IEA's Methane Tracker.

In the coming years, satellite systems are expected to provide regular global coverage of methane emissions from oil and gas operations. Orbital data can help locate super-emitters and improve understanding of methane emission sources, the IEA comments. The Environmental Defense Fund is planning to launch MethaneSat in 2022, targeting key regions that account for more than 80% of global oil and gas production, with enough detail to identify the location to within 400m of the source and detect differences in concentrations of methane as low as two parts per billion.

Technology is moving rapidly in this area, enabling the use of more remote detection technologies, says the IEA. Tools such as fixed-winged aircrafts, drones and satellites can be used in conjunction with others for optimal results. For instance, a promising approach to cost-effective LDAR is to integrate high-level screening and close-range detection technologies. In this context, orbital images may help identify accidents and super-emitters, while aerial detection pinpoints facilities that have significant methane contributions, and onsite monitoring efforts assist in managing smaller leaks. ■

“A wide variety of technologies are available to reduce methane emissions.”

Oil and gas industry strengthens commitment to reduce, report and monitor methane emissions

MAJOR PLAYERS IN the oil and gas industry have signed up to the OGMP 2.0 framework which commits them to report methane emissions with a new, higher level of transparency.

The Oil and Gas Methane Partnership (OGMP) is a Climate and Clean Air Coalition (CCAC) initiative led by the UN Environment Programme (UNEP), the European Commission (EC), and the Environmental Defense Fund (EDF). Already 62 companies with assets on five continents representing 30% of the world's oil and gas production, have joined the partnership.

The new OGMP 2.0 framework will improve the reporting accuracy and transparency of anthropogenic methane emissions in the oil and gas sector making it easier for officials, investors and the public to accurately track and compare performance across companies in ways that have not been possible before. It applies to the full oil and gas value chain and includes not only a company's own operations, but also joint ventures responsible for a substantial share of their production.

OGMP 2.0 aims to deliver a 45% reduction in the industry's methane emissions by 2025, and a 60-75% reduction by 2030.

UNEP and the European Commission are also finalising plans to set up an independent International Methane Emissions Observatory (IMEO). It will aggregate and analyse multiple methane emissions data streams, including data reported by OGMP member companies, to accelerate reductions in methane

emissions globally.

"Reducing methane emissions is critical for natural gas to play a role in the energy transition, and this new partnership will foster the sharing of industry best practices, particularly on non-operated assets, and improve monitoring," said Patrick Pouyanné, chairman & CEO of Total. "This is a new step in the fight against methane emissions and our industry is deeply committed to the success of this initiative."

"OGMP 2.0 offers an internationally recognised blueprint to companies across our industry willing to make improvements in their emission reductions in all phases of the value chain. We look forward to continue working with all partners involved, as only through collaboration with international organisations, civil society and governments can we deliver on our common goals," said Claudio Descalzi, CEO of ENI.

The oil and gas industry is investing in technology and research and development in this area. Technology solutions such as machine learning, AI and augmented reality can embed methane management into the digital transformation that oil and gas companies are undergoing. BP, for example, as part of its goal to install measurement at all its major sites by 2023 and reduce methane intensity of its operations by 50%, has invested US\$5mn in Sateflytics methane detection and quantification software, which uses satellites, drones and planes to collect high resolution spectral imagery from the planet's surface. Its technology combines

these images with proprietary algorithms to create unique electromagnetic signatures which can be used to detect changes in the environment, including releases or leaks. Its software visualises these data sets on interactive displays that provide a clear and actionable picture of operations for end-users and alerts them to facility risks, such as methane leaks.

Another example is the a new digital integrated platform, LUMEN, launched by Baker Hughes in 2019, which provides continuous methane monitoring for oil and gas operators using both wireless ground-based and aerial drone-based technology.

The platform includes a full suite of methane monitoring and inspection solutions capable of streaming live data from sensors to a cloud-based software dashboard for real-time results. It consists of two connected formats – a ground-based solar-powered wireless sensor network, and a drone-based system for aerial monitoring.

Using proprietary algorithms and machine learning, LUMEN provides methane concentration data (PPM), as well as the location and rate of the leak, and gives trend analysis. The data is available in real-time via a computer or smartphone. Customers can set their own emissions thresholds, which can be configured for each site and have full visibility of their sites, being able to see instantly when a problem occurs.

Baker Hughes is also working on predictive analytics to predict where leaks could occur, using machine learning.

Newly-licensed UK technology to improve marine oil spill response worldwide

AGILE SPRAY RESPONSE Ltd has been granted the export sales licence to manufacture, market and sell CONVERT400, the HM Government Maritime Coastguard Agency's (MCA) chosen oil dispersant spray system (ODSS). CONVERT400's design improves accessibility to and affordability of airborne spray response strategies used to disperse oil spills quickly and effectively, around the world.

CONVERT400 does not require a dedicated aircraft or the associated annual costs of its maintenance, storage and personnel. Instead, CONVERT400 is 'rolled on and rolled off' a cargo Boeing 737, as required, which eliminates the need for countries and companies to maintain fixed aviation assets to manage the risk of offshore oil spills. The Boeing 737 type is among the most widely used cargo aircraft and CONVERT400 can be used by existing in-country aircraft when they have been modified for both roles.



The system can be installed in a Boeing 737.

CONVERT400 is designed and developed to deal with the impact of oil spills on coastlines and marine ecology around the world. It is integrated with the UK Government's export policy and is available to all global markets.

"CONVERT400 has been developed and extensively tested by the UK MCA to ensure that it meets all current international requirements for the successful management of oil spills in the

marine environment. The overriding aim is to reduce the impact of oil spills on coastlines and marine ecology in a financially efficient manner and make the system accessible to all nations," said Phil Cole, Agile Spray Response CEO.

The successful management and dispersal of oil spills is a time-critical procedure where the speed of response is vital to minimise environmental harm. Agile Spray Response has achieved a rapid response solution by forming a partnership with an 'in-nation' airline which is already operating revenue-earning cargo flights. This makes the need for a dedicated aircraft obsolete.

"The advantage of CONVERT400 is that in three hours the system can be installed in a Boeing 737, loaded with dispersant and be able to start spraying immediately. The commercial advantages are key for this technology to be made available to a greater number of countries and organisations," Cole added.

Image Credit: Agile Spray Response

Safety monitoring in remote oilfields

Data and wireless technologies can detect flammable gas in remote oilfields and enhance safety. Aarti Dange, MEA business development manager for Plantweb Digital Ecosystem, Emerson Automation Solutions, explains.

THE OIL AND gas extraction and production process involves moving huge volumes of highly flammable hydrocarbons at long distances.

Even in the case of abandoned wells, there is a possibility of hydrocarbons in a gaseous state to escape to the atmosphere, making the oilfield a fire prone area. The remote nature of the oilfields reduces accessibility during an emergency.

A recent mishap in Nigerian waters of a workover hydraulic rig, which burst into flames, was due to fluids released to the surface. The offshore oil rigs of the Namibian waters are also threatened with H₂S emissions as a second distinct hydrogen sulfide emission event that occurred closer to the coast. This makes flame and gas detection and monitoring systems a necessity on all remote oil wellheads onshore, offshore, pipelines, gathering centres and processing areas.

Monitoring and communication

Emerson's technologies for flame and gas detections are optical triple IR flame detection, having immunity to direct or reflected sunlight and lightning, Open Path IR type flammable and UV type toxic (H₂S/NH₃) gas detection, which is used for wellheads and pipeline perimeter. Emerson offers a wide portfolio of fixed gas detectors for localised detection of CO, H₂S and CO₂. These devices are placed inside gas separator enclosures or installed on the wellheads.

Aspirated gas sampling systems measure the concentration of specific components in a gas stream flowing through duct using an external instrument. These are deployed for remote and inaccessible locations. These detectors are WirelessHART-enabled which communicate to the central control room in real time about the gas leaks, especially in remote locations. All these technologies are installed in Algerian fields as a fire and gas detection system. With Emerson's Optics Analytics portal, it is possible to have consolidation of all the data from the various installed systems and devices and send out relevant alerts to the key stakeholders including the well operators, supervisors and HSE managers.

People safety

Emerson's Location Awareness system aims to provide relevant-time, safety-focused monitoring of personnel. It is enabled by WirelessHART and consists of Anchors and battery-operated Personnel and Asset

“Emerson's Location Awareness system aims to provide relevant-time, safety-focused monitoring of personnel.”



Aarti Dange is MEA business development manager for Plantweb Digital Ecosystem, Emerson Automation Solutions.

Image Credit: Emerson Automation Solutions

Tags. In the current pandemic situation, this system is useful for tracking the population density around processing areas to ensure social distancing.

Executive action

As the next action, the safety system initiates a shutdown and isolates the well, putting it into a safe state. The Safety Instrumented function has four levels of safety performance as per the international safety standard IEC 61508, ranging from one to four, where four is the highest safety integrity of the safety systems. At the wells, normally SIL2 or SIL3 are designed to provide the desired protection and risk reduction at the well site. Emerson normally deploys DeltaV SIS with electronic marshalling. This system provides the gas/oil well with the fast-automatic shutdown function in response to the detected hazardous event.

Emerson's holistic solution caters to all the requirements of an effective fire and gas system, ensuring oilfield safety right from the realtime monitoring and communication of the hazard, mapping people working in these areas for their safety, data consolidation and messaging, and finally the emergency action taken by the DCS to shut down the wells. ■

Gas detection solutions for the Middle East

Reliable gas detection is a must in the potentially hazardous oil and gas industry. Nowhere is this more so than in the high pressure, high temperature sour gas-rich environment of Middle East, where hydrogen sulphide (H_2S) is an ever-present danger.

RELIABLE AND RESILIENT solutions that can detect H_2S at high temperatures are in demand in the harsh Middle East oil and gas environment.

Such solutions were called for by Abu Dhabi National Oil Company (ADNOC) and its partner Total, who commissioned Haven Fire and Safety, a distributor of Crowcon Detection Systems, to provide a complete fire and gas system for the Ruwais Diyab unconventional gas concession in Abu Dhabi, which spans more than 6,000 km. The system called for sensors to detect H_2S .

"The climate of the region makes it among the most challenging environments for any kind of electronic equipment, including gas detectors," Crowcon comments. At Ruwais Diyab, temperatures can range from 10°C to 65°C with wide fluctuations in relative humidity (RH).

Haven and Crowcon proposed the installation of 27 XgardIQ HT H_2S detectors within Haven's fire and gas system, and an order was duly placed.

Crowcon's new high temperature (HT) H_2S sensor for the XgardIQ has been designed to improve on electrochemical sensor technology, even in tough environmental conditions like those of the Middle East. The new sensor includes innovative adaptations to prevent evaporation, including a more hygroscopic electrolyte, which avoids the drying-out problem seen in conventional electrochemical sensors, and reduced pore size to restrict water entry. Unlike traditional models, it can operate reliably in temperatures of up to 70°C at 0-95%rh, even in harsh conditions, ideal for the Middle East environment. It has a life expectancy of up to 24 months and short response time.

The XgardIQ is a SIL-2 certified, intelligent and versatile gas detector that works with all of Crowcon's sensor technologies, including the HT H_2S . It has non-intrusive calibration with no need for a hot-work permit or special tools (which save on downtime), and auto-sense and auto-configure functions.



Image Credit : Adobe Stock

The harsh oil and gas environment of the Middle East calls for reliable and hardy gas detection solutions.

Also providing gas detection for a gas development project in the UAE are Teledyne

“The climate of the region makes it among the most challenging environments for any kind of electronic equipment.”

Gas & Flame Detection and its partner in the UAE, Al Masood Oil Industry Supplies and Services Co, who announced in December that they had been awarded a significant contract involving the adoption of wireless gas detection technologies as part of the Hail and Ghasha sour gas development project being coordinated by ADNOC. This sizeable project will see the construction of artificial islands for drilling wells, the support of production facilities, and an offshore operations and maintenance base.

Teledyne Gas & Flame Detection will supply,

install and commission a range of its latest technologies in gas sensing, including its wireless MCX-32 integrated alarm and control system, wireless Site Sentinel Site alarm and control system, CX SmartWireless gas detection sensors, BM-25 wireless multi-gas area monitors, and NEMA 7-rated wireless X-40 alarm and control system. The company's rugged trace gas analysers feature fast response time, intrinsically-safe sensors and satisfy multiple international certification standards.

Aside from the capabilities of its solutions, the appointment of Teledyne Gas & Flame Detection to the project centred on the company's dedication to safety, backed by more than 100 years of gas detection experience, the company said.

In July, Teledyne Gas & Flame Detection launched the MultiTox MOS Detector for the oil and gas, petrochemical and refining industries.

By utilising the latest solid-state Metal Oxide Semiconductor (MOS) technology, inside a rugged and durable detector head, it enables H₂S to be detected easily, without the risk of poisoning, while providing sensor life of up to 10 years and an extended five years warranty as standard.

This, combined with the Telecapteur Asset Management Software being developed in partnership with ADNOC, enables automatic visualisation of crucial information, including instant access to historical calibration data, enabling quick and accurate analysis instead of relying on slower paper-based processes.

Furthermore, the company stated that the software simplifies calibration by reducing the number of operators required from two to one, decreasing OPEX spend and ensuring the assets remain fully operational for longer.

Advancing local capabilities

Meanwhile, the region's gas detector



Honeywell is the first international company producing industrial gas detectors in Saudi Arabia.

“The Honeywell facility will produce 10,000 portable gas detectors and 800 fixed gas detectors annually.”

manufacturing capabilities are being given a boost with Honeywell's announcement that it plans to open a facility for the production of gas detection devices in Saudi Arabia. This is in line with the company's commitment to the In-Kingdom Total Value Add (IKTVA) programme, which aims to achieve 70% localisation of production and jobs by 2021 and act as a major enabler of Saudi Vision 2030. The new “Made in the Kingdom” Honeywell factory will create production jobs for Saudi nationals that enhance workforce skills and capabilities.

Through the new factory, Honeywell becomes the first international company

producing industrial gas detectors in the kingdom, the company says, enabling local availability of the equipment, shorter lead times, and on-the-ground customer support. The devices will provide a reliable and cost-effective way to ensure the safety, compliance and productivity of workers who are operating in hazardous environments in Saudi Arabia.

“Our advanced gas detection systems help keep workers safe and enable them to rapidly respond to gas leaks and site incidents,” said John Waldron, president and CEO, Honeywell Safety and Productivity Solutions (SPS).

Located at the extension of Dhahran Techno Valley, the Honeywell facility will produce 10,000 portable gas detectors and 800 fixed gas detectors annually when it reaches full production in 2022. The production line includes the multigas Honeywell BW series, its next generation multigas platform, in addition to fixed detectors including Searchpoint Optima Plus Point infrared hydrocarbon gas detector and XNX Universal Transmitter. ■

MPS sensor added to Crowcon gas monitor

CROWCON DETECTION INSTRUMENTS has added the Nevada Nanotech Molecular Property Spectrometer (MPS) sensor to its Xgard Bright fixed gas monitor. As one of the world's first fixed detectors with MPS, Xgard Bright is expected to set new standards in gas detection and safety, while driving down the total cost of ownership.

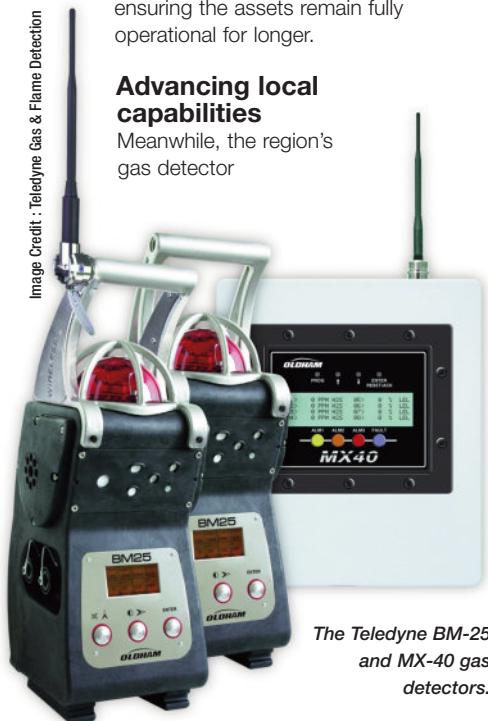
“The MPS sensor has features such as long life, no calibration, no poisoning and gas classification that deliver improved detection capabilities and performance as well as reducing the burden of calibration and maintenance activities for sectors that find other sensors costly and prone to failure,” said Will Allum, product manager for Fixed Systems at Crowcon.

Designed for multi-gas environments such as those in waste energy, wastewater, green energy, bio-gas, petrochemical, oil and gas, and industrial manufacturing.

NevadaNano said its MPS sensors are the first innovation in flammable gas detectors in 40 years and apply the latest micro-electromechanical systems (MEMS) technologies to deliver unparalleled results.

MPS sensors can detect up to 15 flammable gases using real time measurements.

Because the Xgard Bright with the MPS sensor is precise, with no drift over time, and does not require a correction factor, it swiftly, clearly and accurately reports how close the ambient gas levels are to the lower explosive limit (LEL).



The Teledyne BM-25 and MX-40 gas detectors.

Image Credit : Teledyne Gas & Flame Detection

Image Credit : Honeywell

Setting the standard for compressor installations

Internationally recognised, the American Petroleum Institute's standards set the bar for compressed air systems in the oil and gas sector. Amit Bhan, regional head of sales for the engineering project solutions business unit at Ingersoll Rand in the Middle East, discusses what the standards entail and the kind of considerations these cover for compressed air installations in oil and gas facilities.



Compressors play an essential role in the oil and gas industry.

Image Credit : Ingersoll Rand

SINCE 1924, THE American Petroleum Institute (API) has been the leading authority on establishing and maintaining standards for the worldwide oil and natural gas industry. These standards serve to enhance the safety of industry operations, assure quality, help keep costs down, reduce waste and minimise any confusion around recommended best practice.

There are a range of API standards governing compressed air installations, adhered to by many offshore platforms around the world, including the Middle East. Internationally recognised, these standards include 618 for reciprocating compressors, 619 for rotary compressors, 681 for liquid ring compressors and 672 for centrifugal compressors. For large-scale engineering, procurement and construction (EPC) projects in the oil and gas sector, a thorough understanding of what these standards entail and the demands that compressors need to meet is key.

Those working to these standards are able to offer clients guaranteed assurances, with equipment built to API specifications and operated according to API practices. In the case of some EPC contracts, these standards are legislative and regulatory requirements, because they are viewed as critical for helping to safeguard the health and safety of those using a facility.

So what key assurances does compressor equipment that meets API standards offer EPC clients in the oil and gas sector?

1. End-user safety

Whether end users are onshore or offshore, guaranteeing the health and safety of site operatives should be a number one priority. Adhering to API standards demonstrates that the correct steps have been taken to safeguard the safety of a facility's employees. Compressed air equipment has been designed and built to API specifications and best practice, mitigating any risks to the operator, or at least reducing these to an acceptable level.

2. Greater efficiencies

Using API standards as a framework provides a clear structure for operating processes. Compressed air systems that are designed to these standards will be optimised for performance and managing any potential issues that might arise, so that these can be dealt with and resolved quickly.

3. Environmental and public safety

Meeting sustainability goals is key for most modern businesses. Specifying equipment that meets API standards helps ensure any opportunities to lessen the environmental impact of operations or limit any risks to ecosystems will have been taken, while ensuring the safety of the general public too. The potential damage to brand reputation should an incident occur can be significant.

4. Reduced downtime

Any equipment inefficiencies will result in production losses, and impact potential revenue and profit. Not to mention, should problems arise with a compressed air system, then there will be additional costs to remedy these. While there are some potential instances of downtime that are unavoidable, equipment that meets API standards can provide that added assurance that all possible measures have been taken to ensure safer operations with little to no downtime.

5. Protected investments

A compressed air system – particularly those specified on large-scale EPC projects in the oil and gas sector – is a sizeable investment. To help ensure a compressed air installation continues to deliver against expected projections for its service lifetime, equipment that adheres to API standards should perform as expected throughout the duration of its working life. As such, clients can protect their capital investments with products that meet API standards.

Further considerations

Many API standards will be included in contractual agreements to guide the specification and control the quality of compressed air systems, and so it is critical that suppliers have the experience and expertise to meet these demands.

API standards cover every aspect of compressor technology. From general system considerations, such as its design, the materials used, casings, rotating elements, dynamics, bearings and bearing housings, shaft and seals, and integral gearing. Factors such as a site's altitude, ambient temperature, and the weather and humidity of the region can all influence the best compressor for the job. For example, when it comes to the design of a compressor for an oil and gas installation, there are many factors that can be customised to help meet API requirements. This might include special separators for wet gases, or stainless steel components and piping to overcome the effects of demanding operating environments.

They also set out the criteria that need to be satisfied for inspection, testing and preparation for shipment. One consideration might be the package that a compressed air system is delivered and housed in. This will potentially cover structural bedplates, machinery mounting pads, pipework, tubing, electrical wiring, instrumentation and controls. Some compressed air suppliers – such as Ingersoll Rand – can customise packages to meet API demands. For instance, one option would be a shelter to house the entire system, apart from receivers, with interconnecting piping between the compressor equipment and receivers disassembled for transport. A shelter enables the entire compressed air station to be easily transported, with connection points such as the compressed air outlet, cooling water drains, and electrical



Image Credit : Ingersoll Rand

CompAir air compressor, AI-Nasr Package 2.

supply points designed to match the customer's layout. A shelter also ensures ambient conditions inside the housing are controlled, contained within a compact design, while incorporating evacuation ducts for cooling air outlets, too. Alternatively, EPC projects may find a skid solution more appropriate. It is these kinds of considerations that the API standards will provide advice and recommendations on.

API standards in action

One project where all these considerations had to be taken into account was with Hyundai Heavy Industries (HHI). A complete compressed air system was supplied as part of its EPC contract with the Abu Dhabi Marine Operating Company for the Nasr Full Field Development Project (Package 2).

Located 130 km northwest of Abu Dhabi in the Al-Nasr oilfield, the new 'super complex' from HHI helps increase the oil production capacity of the offshore field from 22,000 to 65,000 bpd. The facility includes a gas treatment platform, which is where the compressed air system from Ingersoll Rand is sited.

Ingersoll Rand's scope of supply included design, fabrication, supply, inspection, transportation, testing and commissioning of the compressed air equipment and plant systems. The compressed air system includes four oil-free, air-cooled rotary screw compressors, two sets of heatless desiccant-type air dryers, two DCS/ESD unit control panels and UCP (BN3500) machine monitoring systems, filters and accessories. The mechanical packages were installed outdoors on the top deck of the facility, and so these needed to be able to withstand the elements, while the control and monitoring units were located indoors.

The compressors use air-cooled technology to cool and seal the compression process, maximising the units' overall efficiency, while sealed-for-life bearings that require no oil lubrication are also used on the machines. The compressors' compact and noise-limiting enclosure helps simplify the installation process, as well as ensuring quiet compressor operation at all times.

Given its application, the compressed air system naturally needs to be able to withstand corrosion caused by salt spray from breaking waves. Therefore, all the piping within the compressor and dryer packages is 316L grade stainless steel, to help protect against the elements. The lubrication system, including the oil reservoir, also uses 316L grade stainless steel to comply with the project's specification ■

To find out more about Ingersoll Rand's EPC expertise, please visit www.gardnerdenver.com/engineering-project-solutions



Image Credit : Ingersoll Rand

Air dryer package, AI-Nasr project.

Balanced cement plugs - necessity & challenges

There are a number of challenges which can be faced in cement plugging operations.

Emad Elfeki, well operations specialist, ADNOC Offshore, discusses the challenges associated with the balanced cement plugs operation, and how they can be addressed.

Image Credit: Shutterstock

THE MOST COMMON method used for the placement of cement plugs is the balanced plug method. It is used for applications such as:

- Partial isolation of unfavourable zone producing water and decreasing well potential, where the zone is watered out and recompletion well is needed on a higher zone;
- Securing risk rank wells and recompletion wells;
- Plug and abandonment utilising coiled tubing operation.

There are a number of challenges which can be faced during cement plugging. These include:

- Losing all cement and formation still losing/gaining (plug failed)
- Cement spread on the low side of most horizontal wells due to operational errors
- Well completion string is plugged or partially restricted inside diameter due to

incorrect implementation

- The well is not completely pressure controlled, so there is a gain from the formation which goes into the cement while it is still green, causing channelling or contamination. Consequently the plug does not hold when it hardens, so the situation will need to be remedied. The cement will need to be squeezed, or re-drilling will be required to reduce the height of cement, complete the job and secure

“ There are different approaches that can be adopted to ensure the cement plugging is successful first time.”

the well with proper isolation procedures, thus incurring extra costs and requiring additional time

- High salinity or salt rocks could make G-class cement lose its water and consequently flash set
- If pumping pressure is not controlled, frac might occur
- The existence of coral reefs or rocks, or casing shoe is not holding / free pipe
- Communication between strings and casing
- Unbleedable annular pressure with direct communication with the tubing string
- Cavity and wash-outs in open wells is a challenge. Even extra designed slurry volume for slim hole will not be enough (hole updated calliper run is to be considered)

Cement plugging is not new; it has been done since the beginning of the oil industry. However there are different approaches that

can be adopted, according to the conditions of the well, to address the above challenges and ensure that the cement plugging is successful first time, thus resulting in more efficient and cost-effective operations. The following case studies illustrate different techniques for successful cement plugging:

1. One in / one out – the latest successful technique

In open-hole wells, this method eliminates many of the problems that had previously been faced in setting cement plugs in well intervention operations.

First, displace hole with calculated killing fluid with marginal over balance pressure. Measure loss/gain rate and duration of time it takes until the case is changed.

Run in hole with coiled tubing size adequate to the volume and rate you plan to displace, even smaller than minimum completion restriction, using a spiral nozzle equal in sum to 60% of the cross sectional area of coiled tubing's inside diameter, to keep back the pressure inside the coiled tubing and cause the cement to be displaced in froth shape.

Displace the hole and circulate the well up while the well cracks open, so control in is equal to flow out, measuring the same pumping rate equal to the recovery rate (in BPM), to be able to later utilise the cement with the same pressure and rate, taking into consideration the difference in weight, pumping pressure and coiled tubing annular pressures to avoid reaching formation frac pressure.

While coiled tubing is at the bottom of the required isolation zone, spot calculate spacer volume, and monitor the well for any loss or gain, which will be closely controlled and monitored by the return rate and pumping /wellhead flow pressures.

Start to displace the cement out of the coiled tubing, pull out of hole (POOH) the coiled tubing at controlled speed, while keeping +/- 20 ft of coiled tubing end covered all the time with cement. At this stage, the rate should be one barrel in and recovering one barrel out, measuring all pressure changes. This will give you a clear indication during the job that the cement is not losing to formation until the first filter cake of cement starts to format, and consequently pumping pressure will increase significantly.

At the end of the cement volume, continue to POOH coiled tubing to planned top of cement. Circulate excess cement out of hole. At this stage, keeping control of the same volume in and volume recovered out, maintaining pressure is the main issue to protect your plug from becoming contaminated with any gain from formation or getting channels breakthrough. The pumping rate can be increased to allow higher annular velocity to carry excess cement out of hole. This will be limited to the equal volume in/out concept.



Image Credit: ADNOC Offshore

Emad Elfeki, well operations specialist, ADNOC Offshore.

Stop pumping after the excess cement and spacer is received on the surface. Shut in the well, POOH slowly while substituting with metal displacement volume through the coiled tubing at low pulling speed to avoid a swabbing effect and pumping rate to avoid pressure balance above the CMT plug.

“To start the remedy, an injectivity test was carried out.”

2. Cement plugs for the remedy of old failed isolation plugs

This case relates to a triple completion oil producing old well of more than 50 years of age. This well was isolated with mechanical plugs in a 4 ½" completion string followed by

a cement plug, in perforated cased hole. The cement was found to have channelling, which caused leakage of oil and gas.

To start the remedy, an injectivity test was carried out, with minimal acceptance (not countable) to 500 up to 2,700 PSI with increments at 200 PSI intervals and monitoring. In a short time, it bled off to zero.

Calculate the cement plug volume weight and chemicals, displace with coiled tubing, keeping the coiled tubing end immersed in slurry +/- 150 ft, while pulling out of hole and keeping positive pressure on the cement of 600 PSI (more than the final well-head shut in pressure).

Finish the designed cement at the proposed depth, displace the coiled tubing with spacer, keep pulling out of hole while compensating metal displacement.

In this case will continue pumping water as calculated metal displacement with controlled pulling speed for the coiled tubing.

When it has reached the surface, raise the static pressure to 1,500 PSI positive pressure on wellhead pressure, and monitor its dropping rate without compensating.

Wait on cement for 30 hours, or as per lab data.

Wells will be secured with minimum two barriers as per standard regulation as a minimum.

3. Isolation well with high losses

A further well case study concerns high loss when heavy fluid is displaced into the well hole.

The well is a cased hole, perforated. In this case, place the balanced cement plug to the designed depth, and to keep integral, spot and displace calcium carbonate pill (medium/coarse) to control losses (used as loss circulation material).

Proceed with spacer/cement slurry/spacer as designed.

POOH the coiled tubing while slow metal displacement, maintain positive pressure on surface plug, maximum 50-100 PSI.

When the coiled tubing reaches the surface, monitor wellhead shut-in pressure and wait on cement. ■

Deep Casing Tools secures new investment

ABERDEEN-HEADQUARTERED DEEP CASING Tools (DCT) has secured new investment of around US\$2.19mn from Scottish Enterprise and its long-term backer, EV Private Equity. The investment aims to allow the firm to increase CAPEX investment and bring new technologies to the global market.

In early 2020, DCT announced that a UK patent had been granted for its MechLOK Drill Pipe Swivel (DPS), the industry's first mechanical DPS.

This builds on its success in 2019, when the firm's Casing Cement Breaker (CCB), an industry first, was trialled by Equinor in the Huldra Field, reducing the force required to pull a piece of casing by around 40%. At this time, DCT also entered into a unique partnership with the Oil & Gas Technology Centre (OGTC) to progress further trials of the CCB with future plans in place to create a full casing recovery system.

The funding will allow DCT to continue to trial and patent new technologies and help the firm further expand its global footprint and exporting capabilities on the UK Continental Shelf, Asia, the Middle East and the USA.

Enabling digital transformation

Blair Wilson from Rockwell Automation explains how a digital transformation strategy that includes upgrading to a modern distributed control system can help producers be more productive, profitable and reduce risk.



Image Credit : iopbar/Adobe Stock

PRODUCERS AND MANUFACTURERS – operating in industries ranging from pharmaceutical, consumer packaged goods, food and beverage to mining and chemical – are adept at navigating the complexities and challenges of staying competitive.

Producers must strive to protect the bottom line and optimise production by expanding throughput, decreasing downtime, improving consistency, delivering quality, and keeping employees safe. They also must consider the lifecycle costs associated with engineering, inventory, and system maintenance and support.

Throw a worldwide pandemic into the mix, and it becomes clear just how important it is to be as productive and profitable as possible while reducing operational risk.

So how can a process industry producer or manufacturer move beyond the status quo to keep up with industry and technological trends? How can they take their operations to

the next level of sophistication and innovation to help achieve success and growth in the short and long term?

A one-size-fits-all solution just will not cut it anymore. It is time to get surgical about solutions. Enter: digital transformation as enabled by the modern distributed control system (DCS).

“Digital transformation is a fundamental, cultural shift impacting how organisations work, how the plant floor operates and how value is delivered to customers.”

A digital transformation strategy for DCS

Digital transformation can be described as modernising, upgrading, or improving operations by integrating digital technology into all areas of your business.

Digital transformation is a fundamental, cultural shift impacting how organisations work, how the plant floor operates and how value is delivered to customers. It is about outcomes and meeting ever-changing customer needs. It is a systemic change for any producer – and that is why a modern DCS can be a cornerstone of this transformation.

Developing a strategy for your digital transformation means determining objectives and business goals, assessing the system needs to achieve those objectives, and planning the execution of your strategy. With competitors investing in technology and transforming their operations, the pressure is on to do your research and make decisions. A

good question to start with is, “Do I need an upgrade?”

A traditional DCS features a closed system design, is difficult to migrate and modernise, and has a higher total cost of ownership in most cases. The modern DCS is preferable for many reasons, including higher performance, site-wide availability, scalable system capabilities, the open technology stack and the ease of integration. A plant-wide control system using common automation technologies enables seamless integration for process control, discrete control, power control and safety control with plant-floor and business systems.

If you think your DCS has run its course, you are not alone. The global DCS installed base nearing end of life totals about US\$6bn. And many of these systems are more than 25 years old and in dire need of updating.

Reasons to replace a DCS can include an increased failure rate, higher incidence of off-spec product, accelerating maintenance costs, lack of legacy DCS expertise, capacity limitations, and inability to interface with contemporary systems.

A modern DCS addresses modern challenges

The latest DCS platforms have kept pace with technological developments. And more DCS users are now considering upgrading and modernising their systems for optimal performance. A modern DCS can help build a connected enterprise as part of a digital transformation strategy.

PlantPax 5.0, the latest DCS release from Rockwell Automation, will reduce the architectural footprint with fewer servers and more powerful controllers, drive consistency with embedded process instructions in the controller, streamline workflows with an improved development experience of system attributes, provide robust analytics for real-time decision-making, and align with international cybersecurity standards.

What does that mean for producers? It makes life simpler. A modern DCS should



Photo Credit : Rockwell Automation

PlantPax 5.0 makes life easier for producers.

enable producers to achieve plant-wide control and optimisation, maximise operations, achieve high availability, reduce costs and increase production.

What should a producer look for in a modern DCS?

- Data, analytics and insights that enable real-time decision-making. This includes visualisation and dashboards for operations that provide production and operator KPIs, sight to abnormal situations like alarm logs and unexpected downtime events, and a modern approach to HMI graphics.
- Support for a system over its lifecycle. Customers know they can depend on Rockwell Automation products. They will last a long time. Beyond the initial purchase and commissioning, people will continue to get customised support for years to come. That includes access to subject matter experts, field services, support contracts, and long-term product availability.
- Workforce solutions. From remote access

and mobile devices to training for the shift from specialist to generalist, the modern DCS can help address common workforce issues. It provides an enterprise-wide view so staff are not needed onsite, and encourages the shift from reading and memorising manuals to being able to access expert help as its needed.

- Cybersecurity for systems. Adhering to cybersecurity standards and certifications for standards such as ISA99/IEC 62443 should be the expectation for any producer.

PlantPax 5.0: the latest DCS release

PlantPax 5.0 has a smaller footprint that is easier and faster to deploy, provides real-time data and analytics for informed decision-making, and is supported throughout its entire lifecycle, which is not lost on producers.

Those in batch, hybrid and heavy industries can benefit from a DCS that is purpose-built for plant-wide control and able to serve larger and more complex operations securely. ■

Tenable report reveals extent of data breaches

ANALYSIS OF BREACH data by Tenable has revealed that, from January through October 2020, there were 730 publicly disclosed events resulting in more than 22bn records exposed worldwide. 35% of breaches analysed by Tenable were linked to ransomware attacks, resulting in tremendous financial cost, while 14% of breaches were the result of email compromises. One of the overarching themes of the threat landscape in 2020 was that threat actors relied on unpatched vulnerabilities in their attacks as well as chaining together multiple vulnerabilities as

part of their attacks. This analysis has been published in Tenable's *2020 Threat Landscape Retrospective (TLR)* report which provides an overview of the key vulnerabilities disclosed or exploited in 2020. Two notable trends from the report are:

- Pre-existing vulnerabilities in virtual private network (VPN) solutions — many of which were initially disclosed in 2019 or earlier — continue to remain a favourite target for cybercriminals and nation-state groups.
- Web browsers such as Google Chrome, Mozilla Firefox, Internet Explorer and

Microsoft Edge are the primary target for zero-day vulnerabilities, accounting for more than 35% of all zero-day vulnerabilities exploited in the wild.

Fixing unpatched vulnerabilities, implementing strong security controls for remote desktop protocol, ensuring endpoint security is up-to-date and regularly performing security awareness training are steps organisations can take to thwart some of these attacks, Tenable advises.

The report can be downloaded from Tenable's website at <https://tenable.com>

Pushing ahead with digitisation in the energy sector

Research suggests it is an opportune time post-pandemic for the energy sector to digitise operations, says Colin Beany, vice president for Energy, Utilities & Resources at IFS.

VIRTUALLY EVERY PART of the energy sector, from oil and gas to renewables and utilities, is going through a volatile time now, and was even before the onset of the coronavirus pandemic.

Different energy industries in different parts of the world may fare better or worse according to the way government stimulus dollars for pandemic relief are invested. In France for instance, much of French President Emmanuel Macron's 100bn Euro stimulus package will focus on green energy and transportation. US stimulus efforts, on the other hand, have hitherto favoured the oil and gas industry, decreasing taxable profits and amending legislation so some of the more indebted companies involved in exploration and production can qualify for emergency

loans, cutting royalties for use of public lands and rolling back environmental regulation on the industry.

Globally however, diverse market shifts are still the most potent force acting on the energy sector. Oil and gas was already struggling with a drop in crude oil prices when the pandemic hit, while wind energy is riding a multi-year surge – the Global Wind Energy Council expects 6.6 GW of net new wind generation capacity to be installed this year.

But one thing is true to varying degrees across the energy sector – many companies have people, including middle managers, engineers and executives – with the bandwidth to invest in transformation projects. Oil and gas projects are still somewhat scaled back. Large-scale industrial demand for electric power is reduced. Green energy

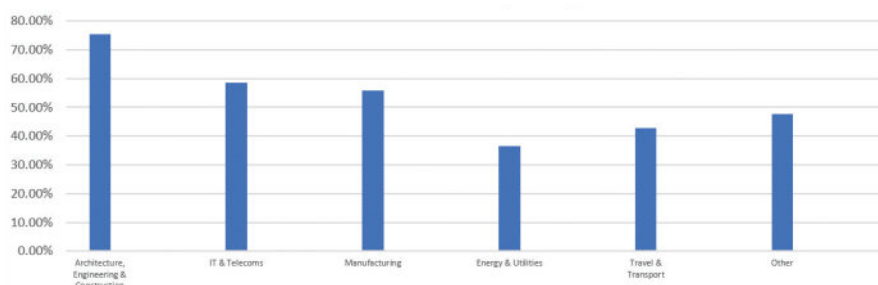


Colin Beany, vice president for Energy, Utilities & Resources, IFS.

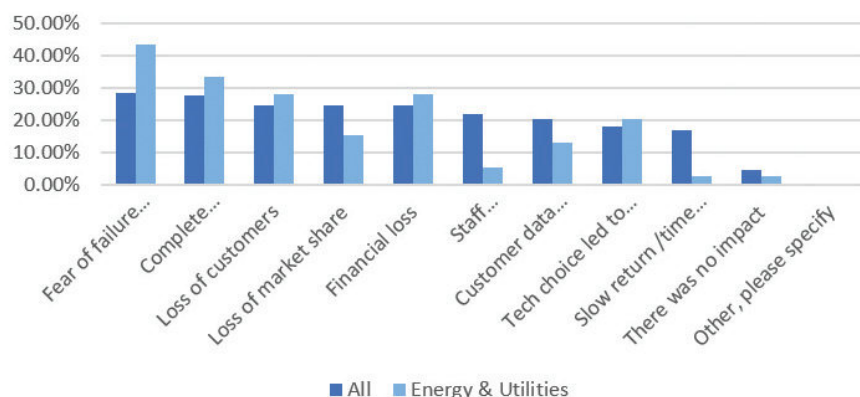
projects are in flux. New research from IFS suggests despite this volatility, many energy sector companies are investing in digital transformation. While not at the same rate as study respondents in other industries, most energy industry companies are still investing human capacity in improvements for the intermediate to long-term future, digitising manual process flows and preparing not only to handle the return to full capacity, but also to introduce new autonomous and efficient business models and approaches to delivering value to the customer.

Budgets growing or holding steady

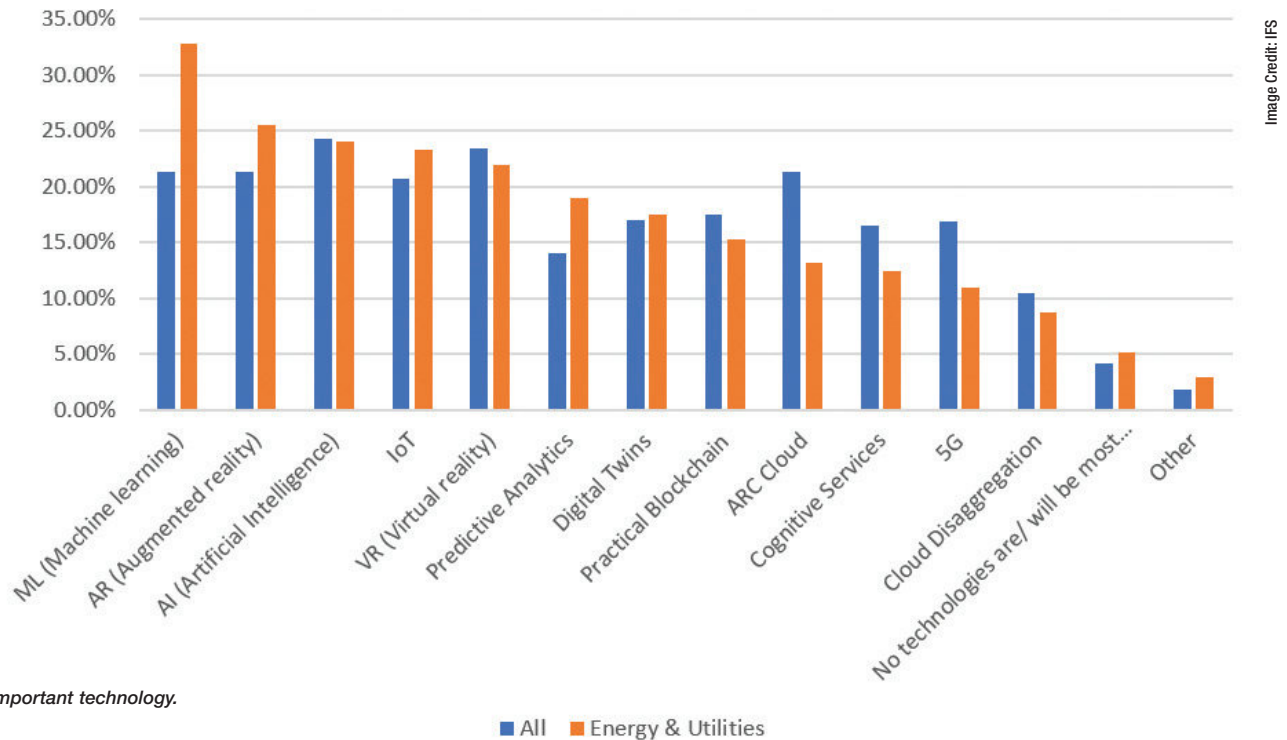
The IFS study data, collected during the onset of the coronavirus pandemic, reveal that 57% of energy and utilities sector companies plan to increase or maintain current digital transformation spending levels despite volatile conditions. However, respondents in this sector are less aggressive than their counterparts in other industries, and are 16% less likely than all respondents to plan increased digital transformation spending. Energy and utilities respondents may find the demanding nature of their operating environments a strong disincentive to undertaking broad digital transformation initiatives. Their most frequently reported



Plans to increase digital transformation spending.



Impact of digital transformation project failure.



Important technology.

concern with digital transformation, at 38%, is the difficulty in reconciling the strategic needs of the business with the ability to deliver on the front line.

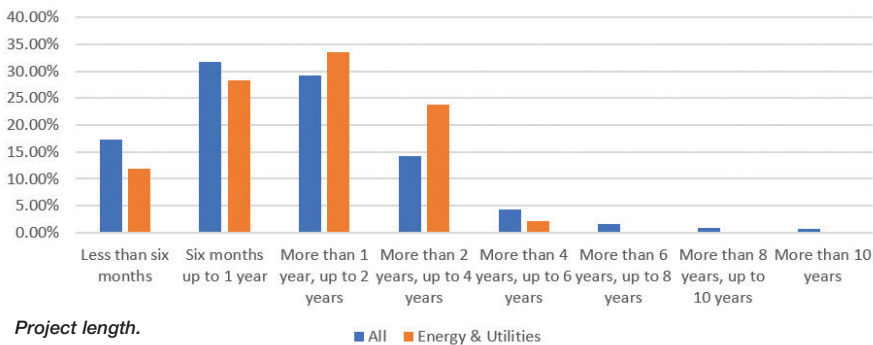
Energy and utilities sector companies may also be conservative, given mixed results with earlier digital transformation projects. Companies in the sector are 7% less likely than all respondents to characterise past digital transformation projects as a success.

They are also more than twice as likely than all respondents to say it has taken them more than a year to recover from failures, 15% more likely to say this failure has led to a fear of failure across the business, and almost 5% more likely to report a financial loss.

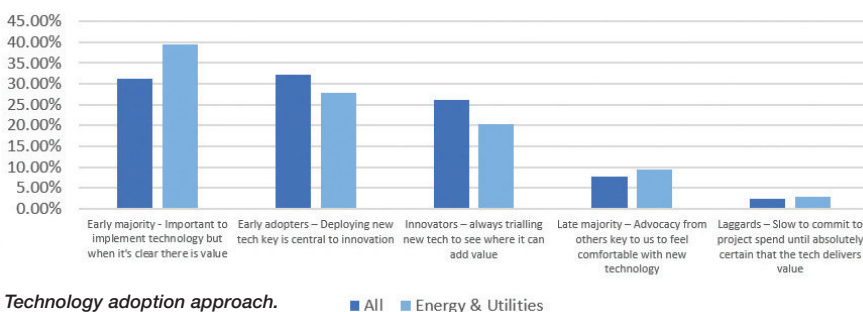
No luddites

Energy and utilities companies, however, have had to adopt forward-looking technologies –

particularly in areas such as preventive maintenance and process automation. They are 18% more likely than all respondents to classify themselves as early majoritarians with regard to technology adoption – they believe it is important to implement technology once there is clearly defined value. Respondents in the sector were 12% more likely to say machine learning was an important technology to them than were respondents as a whole, and 4% more likely to value augmented reality.



Project length.



Technology adoption approach.

A way forward

As McKinsey points out, energy and utilities entities across the board are in dire need of innovative, technological solutions to increase competitiveness and maintain profitability.

“While the depth and duration of this crisis are uncertain, our research suggests that without fundamental change, it will be difficult to return to the attractive industry performance that has historically prevailed,” the McKinsey team writes. “On its current course and speed, the industry could now be entering an era defined by intense competition, a technology-led rapid supply response, a flat to declining demand, investor scepticism, and increasing public and government pressure regarding impact on climate and the environment.”

Despite unprecedented pressures, companies in this sector are able to implement new and disruptive technologies that can enable them to survive and even thrive. And particularly if a management team has excess bandwidth or capacity, now is an excellent time to focus internal teams on digital transformation. ■

HMi Elements launches hazloc computer rental offer

HMI ELEMENTS HAS launched a hazardous location-certified computer rental offering for the oil and gas industry, which it says is the first in the industry. PCs are available to rent on a daily basis from US\$59 a day, with global deliveries despatched the same day from HMi Elements' offices in Houston, USA and North Yorkshire, UK.

HMi Elements is initially offering its 1302 model that is IECEx, ATEX, CSA Canada and EAC Russia certified for use in Zone 2 hazardous areas. It is a slim and lightweight computer with a super bright 19", 1,000-nit multitouch glove-friendly touchscreen. It is equipped with Ethernet and Wi-Fi as standard and has Windows 10 LTSC installed.

HMi Elements has designed and manufactured hazardous area-approved computers for the world's leading oilfield services companies and their customers for the past 30 years.

The move to offer a rental option comes in response to wanting to service a wider range of customers and addressing the impact of COVID-19 on oil and gas companies.

HMi Elements' chief executive, Howard Gould, said, "Over the three decades we've been in business, we have created a number of firsts with our state-of-the-art products and now we are



Howard Gould, CEO, HMi Elements.

doing so with this service we are offering.

"We are the first to offer a HMI rental option for hazloc areas, and decided to do so because we know business success stems from being able to pivot easily and innovate faster than the competition. It is the perfect solution to the capex and cashflow pressures oilfield services companies are facing.

"COVID-19 depressed oil prices, and a reduced rig count has placed a huge strain on the sector. We're providing options for an easier way of operating."

Axis Communications appoints new regional director

AXIS COMMUNICATIONS, A market leader in network video, has announced the appointment of Ettiene Van Der Watt to the role of regional director, Middle East & Africa. Van der Watt has been with the company for almost a decade, and has been head of sales engineering and training as well as the business development teams in MEA. He now heads Axis operations in the MEA sales region, which includes the GCC, Africa and Levant countries.

Ettiene Verena Rathjen, vice president EMEA, Axis Communications said, "The world is changing fast, and we make sure we stay ahead of those changes. While security is still our main focus, we are expanding into related markets using new network-based products and solutions such as access control, audio, analytics and wearables. Long-term partnerships have been the principle that guided us since our founding and allowed us to scale innovation and solve complex challenges together. I am convinced that Ettiene and his team will continue to build on these partnerships so that we can continue to be successful together."

Aramco and stc unveil Dammam 7 supercomputer

ARAMCO AND STC have announced the launch of the Dammam 7 supercomputer, which ranks among the top ten most powerful supercomputers in the world. The supercomputer presents new opportunities in both exploration and development and enhances Aramco's exploration and investment decision-making. This is the next step in Aramco's digital transformation, complementing a suite of advanced technologies that are reshaping core operations, driving efficiencies and reinforcing its industry leadership in geoscience.

Dammam 7 was developed at Dhahran Techno Valley in partnership with Solutions, a subsidiary of stc Group, the largest telecommunications provider and operator in Saudi Arabia, and CRAY, a Hewlett Packard Enterprise subsidiary. It has 55.4 petaflops of peak computing power, allowing it to process and image the world's largest geophysical datasets.

The Dammam 7 supercomputer, named after the first oil well discovered in Saudi Arabia, will push beyond the traditional boundaries of exploration and production through cutting-edge technology. Sophisticated imaging and deep-learning algorithms will allow it to run detailed 3D earth models, improving the company's ability to discover and recover oil and gas while reducing exploration and development risks. It will further enhance decision-making for exploration and development of conventional and unconventional hydrocarbon resources, as well as guide future investments in production and resource allocation.



The inauguration of the supercomputer.

Aramco president & CEO, Amin H. Nasser, said, "The Dammam 7 supercomputer is named after the first commercial oil well discovered in 1938. It will help us with breakthroughs as part of our long term "Discovery and Recovery" strategy in our upstream business. This technology that processes complex data faster will enable new discoveries and enhanced recoveries, which are crucial to both ensuring the availability of adequate supply to meet the demand for energy and to cut costs while boosting productivity. Continuous investment in innovative technology is

an essential enabler of our company's long-term growth strategy, and Dammam 7 is another step in our plan to invest in the right technology that drives production efficiency and resilience."

stc Group CEO, Nasser S. Al-Nasser, added, "The inauguration of the supercomputer data centre in Aramco will open up new horizons in exploration, which will have a significant impact on data digitisation and quality. These are in line with the digital transformation plans of the desired national outlook, and we are proud to have worked with locals to establish Dammam 7 Center."

AMETEK Land's new borescope

AMETEK LAND, THE monitor and analyser manufacturer specialising in industrial-grade infrared non-contact temperature measurement, has launch its latest mid-wavelength borescope, the MWIR-B-640, designed to enhance temperature and image monitoring of furnaces.

The new model allows for highly accurate and fully radiometric temperature measurement image data to be taken and stored. This data can be collated over the lifetime of a furnace, giving the user a continuous and clear view of the operation, even in heavy smoke and hot atmospheres and analyse the data produced to ensure the operation is efficient and fully functional.

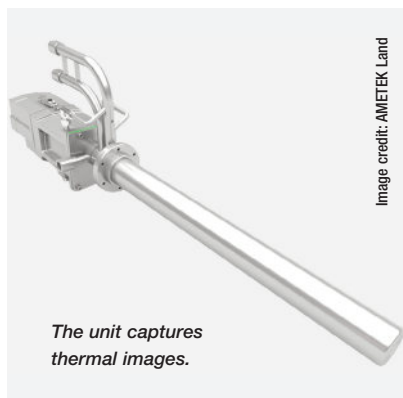


Image credit: AMETEK Land

The unit captures thermal images.

The unit is suitable for hydrocarbon processing reformers, incinerators, annealing furnaces, and biomass, waste and coal boilers. The new borescope uses advanced spectral filtering and a high thermal and spatial resolution to deliver live images of the furnace, boiler and stock, over 300,000 accurate point temperatures in the range of 300-1,200 °C and 500-1,800 °C.

The borescope's high resolution image capture and 90° wide-angle field of view, means multiple areas can be captured and measured simultaneously. The wide-angle view of the furnace means data can be viewed in real-time from the facility's control room. The unit can be installed in a small opening in the wall, allowing it to accurately profile the temperature of the entire furnace without affecting the atmosphere, stock temperature, or energy consumption.

David Primhak, director of development and product management for AMETEK Land, commented: "The MWIR-B-640 is an invaluable tool that will prolong furnace and boiler lifetime, optimise production throughput, reduce energy consumption and improve stock temperatures. It has a range of innovative features that ensure it is user-friendly, extremely accurate, and offers a high level of asset protection."

Sullair introduces Tier 3 OFD1550 compressor

SULLAIR HAS INTRODUCED its new oil free portable air compressor, the Tier 3 OFD1550. The portable compressor can deliver ISO 8573.1 Class 0 oil-free air plantside, refineryside or on site.

As more customers look toward sensitive compressed air needs across refineries and petrochemical sites, products are needed for dedicated oil free plant air and back-up oil-free air; the Tier 3 OFD1550 is Sullair's latest solution in their oil-free portfolio.

Jerel Cole, senior product manager, explained, "Since we introduced our Tier 4 Final OFD1550, we've seen a tremendous response from our rental customers and end users, so we're pleased to introduce the Tier 3 compliant unit into additional markets. The oil-free market continues to expand, and this compressor will help satisfy increased customer demand."

The new unit provides 1,550 cfm of class 0 oil-free air, allowing users to adjust air pressure up to 150 psi. Caterpillar and Perkins provide the power behind the unit. High efficiency rotors, designed for oil free operation, form a two-stage Sullair air end, and are coated with FDA-approved PTFE to resist corrosion, extending air end life.



Image credit: Sullair

The new Sullair unit can provide 1,550 cfm of class 0 oil-free air.

Safe Influx patents well control solution

SAFE INFLUX LTD, an automated well control solution provider, has been granted a patent by the United Kingdom Patent Office, covering the company's Automated Well Control technology and its key elements, including modules utilising the same technology.

The patent reflects the technology's ability to detect fluid influx conditions in a wellbore, choose (against criteria) to shut-in, and automatically initiate a well control protocol that results in the well being safely and automatically shut-in.

Safe Influx's system enables quick identification and reaction during well control sequences, while reducing the size of an influx compared to conventional techniques. This reduces delays, costs and operational issues for the operator. Relying on smaller influx systems enables more efficient well designs, saving an estimated 15% to 20% in well costs.

Bryan Atchison, co-founder and managing director at Safe Influx, explained, "We are very pleased that Safe Influx has been granted this patent for our Automated Well Control, which reinforces our position in the industry. With the technology behind this patent, we are able to provide a system with unique capabilities unavailable from any other company."

Mokveld's self-acting electric actuated valve

THE FIRST OF its kind in a European gas plant, Mokveld has commissioned an electric driven, self-acting control valve, designed for a pressure reduction station.

The system relies on a pressure transmitter connected to directly to the electric drive. The proportional-integral-derivative controller in the drive controls the downstream pressure of the unit. In its current installment, a remote setpoint allows the controlled pressure to be modified on the requirements from the central command centre. This allows pressure to be remotely controlled and altered depending on the environmental or seasonal requirements of the unit's pressure.

Mokveld used the unit to replace a natural gas-driven control loop, vastly reducing the carbon footprint of the operation by diminishing its reliance on natural gases and using an electric power source. The unit's lifecycle cost is also vastly improved by the installation.

The volume downstream of the control valve is vast, allowing for the control loop to stay put if electric power is lost. In the case of electric failure, a generator is automatically started, followed by the dispatch of an alert to the client's service engineer of the error.



Image credit: Mokveld

The unit allows for remote pressure control

Rotork launches advanced analytics programme for the management of intelligent flow control assets

ROTORK HAS RELEASED Intelligent Asset Management, a cloud-based asset management system for intelligent actuators and the flow control equipment they operate. It is a system of advanced analytics to improve reliability and availability of key assets across all industries that use flow control processes. By collecting data and monitoring asset status, Intelligent Asset Management can lead to long-term operational stability.

The key areas of information that are taken from data loggers and uploaded to the system are torque, temperature, vibrability and event log information. Live diagnostic actuator data is available for sites that use a Rotork Master Station.

Intelligent Asset Management can run on all operating systems and is available both as a standalone offering and as part of a combined solution to meet individual customer needs. Performance, process criticality, product and operational data are combined to assess asset condition and determine if any intervention is required to prevent performance degradation or failure. The system is suitable for use with all intelligent actuators across multiple applications.



Image Credit: Rotork

Intelligent Asset Management is available both as a standalone offering and as part of a combined solution.

Grid-powered fracturing operation deployed

HALLIBURTON COMPANY HAS announced it has successfully deployed an electric grid-powered fracturing operation which is being utilised on several pads for Cimarex Energy in the Permian basin. After beginning in November, Halliburton has completed almost 340 stages across multiple wells using utility-powered electric frac pumps.

Grid-powered electric fracturing offers an alternative path to achieving the lowest emissions profile possible compared to both turbines and Tier 4 dual fuel engines. This method also offers additional operational reliability and requires a lower capital outlay compared to turbines.

Michael Segura, vice president of Production Enhancement for Halliburton, commented, "With Halliburton's leading electric fracturing capabilities, coupled with an innovative operator like Cimarex, grid power can offer one of the most effective and capital efficient solutions for electric fracturing."

Halliburton's electric-powered equipment is engineered to utilise the maximum power potential from the grid, allowing the customer to achieve pumping performance of 30-40% more than with conventional equipment.

IRZ introduces new high temperature ESP gauges

RUSSIAN MANUFACTURER OF ALS-related equipment, IRZ, has launched an ESP gauge suitable for high temperature (HT) wells.

The prototype of the HT gauge was finished in April, 2019, for clients demanding HT gauges for use in bitumen fields in West Siberia and Tatarstan, in development with steam-assisted gravity drainage (SAGD).

Having reliable data on well conditions and ESP motor's health is a vital part of a successful flexible, low-maintenance and optimised ESP operation. It is well understood that high temperature affects electronic devices in several ways, therefore, to design a new gauge, IRZ kept in mind every known aspect related to behavior of electronics under high temperature. IRZ also considered ESP-specific matters such as short-term inertial overheating due to interruption of cooling by inflow of fluid during ESP shutdowns.

After a research and development phase consisting of a series of field trials and one-month continuous life test of the prototype in a lab chamber at 180°, the HT gauge was proved to be suitable for operations at temperatures up to 175° with short-term overheating up to 190°. The gauges have already been installed in more than 100 wells in Russia.



Image Credit: IRZ

The new high temperature ESP gauge.

SAP partners DNV GL to deliver cloud solution addressing corrosion

SAP SE AND DNV GL have teamed up to deliver a new industry cloud solution, Corrosion Under Insulation (CUI) Manager, designed to tackle a major problem facing the integrity of oil and gas plants.

CUI is the largest maintenance cost for offshore and onshore installations with insulated pipes. In close collaboration with the industry, DNV GL has developed a new risk-based methodology, published a new recommended practice and turned the insights into an easy-to-use interface with the CUI Manager. Through the strength of DNV GL's models and the integration with SAP Asset Intelligence Network and the SAP Asset Strategy and Performance Management application, this solution will provide an efficient and standardised way to address the risk of CUI.



Image Credit: Shutterstock

CUI is the largest maintenance cost for installations with insulated pipes.

Benjamin Beberness, global vice president at SAP Oil and Gas Business Unit, commented, "In collaboration with DNV GL, we will deliver the first industry cloud solution for the oil and gas industry."

CUI Manager continuously assesses and calculates the CUI risk, helping integrity engineers and managers prevent failure, increase safety and manage hidden threats. It optimises asset strategy and planning by providing detailed, instant insights on current and planned risk as well as the resulting cost development. The solution's full integration with SAP Asset Strategy and Performance Management enables calculation and visualisation of the complete risk picture using SAP Cloud Platform.

"The combination of DNV GL's deep technical insight and state-of-the-art software solutions with SAP's cloud-based solutions for intelligent asset management will generate significant value for our customers," said Liv A. Hovem, CEO of Oil & Gas at DNV GL. "We look forward to bringing additional solutions to the market jointly with SAP in the near future."

Crosby introduces improved high fatigue life shackle



Image Credit: The Crosby Group

The HFL Kenter is a new high fatigue life shackle.

THE CROSBY GROUP has introduced HFL Kenter, a new high fatigue life shackle, under the Crosby Feubo brand, for offshore mooring markets. The Crosby Group is a global leader and pioneer in offshore mooring components for the oil and gas and wind energy markets strengthened by the acquisition of Feubo.

The new HFL Kenter shackle showcases design improvements on the popular Crosby Feubo NDur Link, an accessory used for temporary and mobile mooring applications such as rigging and anchoring offshore platforms or vessels. The HFL therefore represents the latest evolution of the Kenter shackle concept, which is more than 100 years old.

Oliver Feuerstein, global director of Mooring at The Crosby Group, explained the benefits: "The fatigue life is superior, and it can connect to a variety of stud link anchor chain or other mooring accessories such as sockets and swivels. This feature separates the Crosby Feubo solution from any other worldwide and was accomplished by making it from Grade 6 steel. A logical evolution from the Grade 4 Trident Slim and Grade 5 Raptor Crosby Feubo concepts."

"The new Kenter Connection is DNV-GL type approved and features the unique "Fastlock" system – proven to reduce project downtime and mitigate risk from conventional assembly/disassembly methods," Oliver said.

The Crosby Group provides connectors for anchors, chains, wire rope, a range of synthetics, and a variety of other components that are utilised in many applications by oil and gas and wind energy professionals.

Oliver continues, "As many end-users and distributors of lifting and rigging gear will recognise, the HFL Kenter is a much better solution to alternative shackles, many of which are based on a Grade 4 concept that was launched in the 1980s."

IEC Telecom and Thuraya reveal Orion Edge Virtual to digitalise all vessel types

IEC TELECOM AND Thuraya have introduced Orion Edge V ("V" for virtual), a satcom system which offers an affordable VSAT-like experience over compact hardware. Digitalisation, previously reserved for large vessels, is now available for smaller crafts.

At a time when some 60% of Middle Eastern companies report that they are now actively investing in digital technologies, digitalised vessels have a competitive

advantage when it comes to adapting to challenges and optimising business opportunities. The United Arab Emirates (UAE) is one of the top 20 most digitally advanced economies in the world, and in the maritime sector, many Middle East port operators are turning to the Internet of Things (IoT) to drive value in the digital economy, which is estimated to grow to a value of US\$14tn by 2030.

Until now these digital benefits have been unavailable to small and mid-sized vessels. However, IEC Telecom has joined forces with Thuraya, the leading global satellite operator, to bring affordable quality satcom technology to customers with limited onboard space via the Orion Edge V. The new solution enables a VSAT-like communications experience over L-band with access to a cloud-based system, offering a wide range of telecom services.

Incorporating IEC Telecom's OneGate system into the pre-existing Orion Edge solution has brought communications to a new level with a wide range of telecom services now available via a virtual platform. ICT managers can monitor and control the network across all vessels of their fleet remotely via a user-friendly set of dashboards. New services, including telemedicine, videoconferencing, and remote maintenance, can be added on demand via IEC Telecom's application store.



IEC Telecom offers Orion Edge V with flexible tariff plans and an option of free hardware for project-based subscriptions.

Image Credit: IEC Telecom and Thuraya

Emerson and QRI launch cloud-native analytics software for reservoir opportunity identification

EMERSON HAS LAUNCHED SpeedWise Reservoir Opportunity, a fully automated, cloud-native reservoir analytics solution developed in collaboration with Quantum Reservoir Impact (QRI). The software is unique in how it applies advanced algorithms, data mining and workflow automation to cut the amount of work required to identify field development opportunities from months to weeks. The comprehensive solution helps oil and gas companies achieve greater return on investment by shortening decision-making cycles and delivering better risk management.

"In today's turbulent marketplace, our goal is to give customers meaningful analytics to maximise efficiency, optimise reservoir management, and promote digital transformation across the exploration and production landscape," said Steve Santy, president for exploration and production software at Emerson. "By combining the power of analytics with deep oilfield expertise, SpeedWise Reservoir Opportunity provides oil and gas operators with the knowledge needed to better identify opportunity criteria and develop more reliable field development planning."

The solution features automated geo-engineering workflows for identifying and ranking recompletion, vertical sweet spots and horizontal wells. By analysing historical field performance and benchmarking against analog assets, the flexible framework intelligently picks the optimal parameters for the identification process, tailored to address the unique geological and engineering challenges posed by each field.

"SpeedWise Reservoir Opportunity is digital transformation at its best, allowing asset teams to become hyper-efficient in managing reservoirs. Oil and gas professionals can now identify field development opportunities with 10 times the speed and accuracy compared to present industry norms. Using AI, advanced analytics and automation of complex workflows to deliver capital savings – that is a game changer," said Dr Nansen Saleri, chairman and CEO, QRI.



Image Credit: Emerson

Speedwise Reservoir Opportunity solution helps oil and gas companies achieve greater return on investment.

Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS, EGYPT

Project	City	Facility	Budget (US\$)	Status
AGIBA - South West Meleiha Development Lease	Western Desert	Oilfield Development	60,000,000	Construction
AMOC - AMOC 2 - Lube Oil	Alexandria	Lube Oil	800,000,000	Feasibility Study
ANOPC - Hydrocracking Diesel Complex - Overview	Asyut	Hydrocracker	4,000,000,000	Construction
ANOPC- Hydrocracking Diesel Complex - Hydrocracker Complex	Asyut	Hydrocracker	2,800,000,000	Construction
ASORC - Naphtha Complex	Asyut	Continuous Catalytic Cracker (CCR)	450,000,000	Construction
Burullus Gas Company - West Nile Delta Gas Field - Overview	West Nile Delta	Offshore Gas Field	12,000,000,000	Construction
Burullus Gas Company - West Nile Delta Gas Field - Phase 2 + Phase 3 - Giza, Fayoum and Raven Fields	West Nile Delta	Offshore Gas Field Development	800,000,000	Construction
ECHEM - SCZone Refinery & Petrochemicals Complex - Overview	Suez Canal Economic Zone (SCZone)	Petroleum Oil Refinery	6,700,000,000	Feasibility Study
ECHEM - SCZone Refinery & Petrochemicals Complex - Petroleum Refinery Project	Suez Canal Economic Zone (SCZone)	Petroleum Oil Refinery	3,000,000,000	Feasibility Study
GASCO - Western Desert Gas Complex - Train D	Western Desert	Gas Production	100,000,000	Engineering & Procurement
MIDOR - Midor Refinery	Alexandria	Refinery	2,300,000,000	Construction
Nasr Petroleum Company - Fire & Gas Detection and Firefighting Systems For Fuel Tanks, Pump Stations and Compressors	Suez	Oil Storage Tanks	21,000,000	Engineering & Procurement
Petro Shorouk - Zohr Gas Field Development	Mediterranean Sea	Offshore Gas Field	12,000,000,000	Construction
PETROBEL - Nooros Exploration Prospect (Abu Madi West)	Nile Delta	Offshore Gas Field	12,000,000,000	Construction
PhPC - Atoll Gas Field	Damietta	Offshore Gas Field	300,000,000	Construction

Apex International Energy discovers oil in Egypt's Western Desert

APEX INTERNATIONAL ENERGY has announced a new oil discovery in the Southeast Meleiha Concession (SEM), located in the Western Desert of Egypt.

The discovery was achieved at the SEMZ-11X well located 10 km west of Zarif field, the nearest producing field. The well was drilled to a total depth of 5,700ft and encountered 65ft of oil pay in the Cretaceous sandstones of the Bahariya and Abu Roash G formations. Testing of the Bahariya resulted in a peak rate of 2,100 bpd with no water. Additional uphole pay exists in the Bahariya and Abu Roash G formations that can be added to the production stream in the future.

The SEMZ-11X was Apex's second exploration well in an ongoing three-well programme, following the acquisition and processing of 1,342 sq km of 3D seismic data in 2019-2020. The first well, the SEMZ-1X drilled in December 2020, also discovered Bahariya oil with 17ft of indicated pay. Located 23 km west of Zarif field, it was also drilled to 5,700ft and tested at a rate of 100 bpd. Apex plans to fracture stimulate the 1X in the future to increase the producing rate.

"These oil discoveries are an important step in our company's development and in validating our strategy to grow an oil and gas company of substance through a combination of drilling and acquisitions," said Apex's founder and CEO, Roger Plank. "The presence of hydrocarbons in both the 1X and 11X confirms our geologic model and significantly enhances the prospectivity of a number of other mapped prospects and leads across our 2,534 sq km."

The third well of the current drilling campaign, the SEMZ-3X, is scheduled to commence later in January. Apex plans to drill the 3X to a depth of 5,700ft in search of oil in the Bahariya formation. The



The discovery was made at the SEMZ-11 well in the Southeast Meleiha Concession (SEM).

SEMZ-3X location is five kilometres east of Zarif field, which also produces from the Bahariya.

Apex holds a 100% working interest in the SEM exploration concession. The company acquired the concession interest through the 2016 exploration bid round of the Egyptian General Petroleum Corporation (EGPC) and signed the concession agreement in August, 2017.

Tom Maher, Apex's president and COO based in Cairo, commented, "We look forward to working together with our partners at EGPC to further explore and develop the considerable potential of our concession and to expeditiously bring online production from this first discovery."

Image Credit: Apex International Energy

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Project Databank

Compiled by Data Media Systems

Project Focus

Compiled by Data Media Systems

Project Summary

Name of Client	GASCO - Egyptian Natural Gas Company
Estimated Budget (US\$)	100,000,000
Facility Type	Gas Production
Status	Engineering & Procurement
Location	Western Desert
Project Start	Q1-2019
End Date	Q1-2023
Main Contractor (EPC)	ENPPI Petrojet
Contract Value (US\$)	90,000,000
Award Date	Q1-2020

Background

GASCO is planning to build a new train (D) which will be the complex's fourth production train in Western Desert Gas Complex in El-Amreya, Alexandria, Egypt. The project will have a production capacity of 600 MMcf/d, lifting WDGC's overall production capacity from its current 950 MMcf/d to 1.5 bcf/d.

Project Status

Date	Status
Jan 2021	The engineering work is ongoing and the construction work is expected to be started by Q2 2021.
Nov 2020	ENPPI has completed the FEED study.
May 2020	The project work has been started.

Project Scope

The scope of the project includes:

- New Train D will have a production capacity of 600 MMcf/d
- Natural gas processing production of sales gas mainly methane from demethanizer
- Demethanizer for the production of c2c3 product
- Depropanizer for the production of propane
- Debutanizer for the LPG and condensate

Project Finance

GASCO is the client of the project.. GASCO's main shareholders include

- State-owned Egyptian Natural Gas Holding Co. (EGAS) 70%
- Egypt Gas Co. 15%
- Petrojet 15%.

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	DECEMBER 2020			VARIANCE		NOVEMBER 2020		
	Land	Offshore	Total	From Dec. 2019	From Nov. 2020	Land	Offshore	Total
Middle East								
ABU DHABI	28	12	40	-24	-1	29	12	41
DUBAI	0	0	0	-2	0	0	0	0
IRAQ	30	0	30	-47	+3	27	0	27
JORDAN	0	0	0	0	0	0	0	0
KUWAIT	28	0	28	-22	-3	31	0	31
OMAN	42	0	42	-11	+6	36	0	36
PAKISTAN	13	0	13	-2	0	13	0	13
QATAR	2	6	8	-6	-1	2	7	9
SAUDI ARABIA	51	8	59	-56	-1	54	6	60
YEMEN	1	0	1	0	0	1	0	1
TOTAL	195	26	221	-170	+3	193	25	218

North Africa

ALGERIA	22	0	22	-20	-7	29	0	29
EGYPT	15	2	17	-14	0	14	3	17
LIBYA	11	0	11	-5	-1	12	0	12
TUNISIA	0	1	1	-1	0	0	1	1
TOTAL	48	3	51	-40	-8	55	4	59

Source: Baker Hughes

والمستخدمين النهائيين الآخرين. وأشار ديساي قائلا: «لا يزال مشهد عمليات التشغيل يرتبط بالأفراد. حيث يطالب هؤلاء الموظفون بالوصول إلى الأدوات الرقمية وإعادة التدريب على التعلم الآلي (ML) والذكاء الاصطناعي (AI)، وستحتاج شركاتهم إلى البراعة الرقمية لتحقيق ذلك. وسيتمتعون على القادة أن يسألوا عما إذا كانت مؤسساتهم مرنة بما يكفي ومنفتحة على هذه التغييرات. إذ أننا جميعا نحتاج إلى إتقان استخدامها. فلم يعد الأمر كافيا لكي تكون جيدا فحسب، فهناك حاجة إلى التكنولوجيا الرقمية لجذب المواهب. فالمستخدمون الذين يقومون بتشغيل أصول بقيمة 20 إلى 50 مليون دولار أمريكي يرتدون ساعات FitBits حول معصمهم لفحص معدل ضربات القلب بانتظام، وهم يريدون وجود نفس التقنيات لعملياتهم». وأفاد هيدج بأن الخريجين الجدد القادمين إلى الصناعات التحويلية يمتلكون مهارات مثل القدرة على البرمجة باستخدام لغة بايثون، ويريدون استخدامها لتحسين تطبيقات الصناعة التحويلية، لكنهم ما زالوا بحاجة إلى قبول من ذوي الخبرة والمديرين لمساعدة المجال على المضي قدما. وأضاف هيدج: «يبحث مستخدمو قطاع التنقيب والإنتاج وقطاع النقل وخطوط الأنابيب وقطاع الصناعات التحويلية عن كثر في البيانات التي تنتقل عبر شركاتهم. إنهم يريدون «رؤية الجزئيات» تنتقل من الإنتاج إلى العملاء. كل هذه البيانات، من مبانهم ومنصاتهم، تأتي في شكل موجات، ويمكن للرقمنة أن تساعد في تنظيمها». «وهذا أيضا هو السبب في أنه حان الوقت للاستثمار في الرقمنة. فالعائد السريع في الاستثمار مطلوب دائما، ولكن يمكن للمستخدمين تحقيق بعض المكاسب السريعة من خلال الرقمنة، واستخدامها كأساس للانتقال إلى عالم جديد. ونحن بحاجة فقط إلى تنفيذ القليل من الخطوات الأولية للبدء. هذه هي الشركات التي لا تزال بحاجة إلى جني الأموال، ويمكن للرقمنة أن تضيف إلى تلك الأرباح».

واعتماده، وكيفية تجميع الحلول وتقديمها للمستخدمين. يمكن للرقمنة أن تؤثر على جميع الأجزاء في دورة الحياة الكاملة من البداية للنهاية بالنسبة للعديد من الأصول الهيدروكربونية، لذلك علينا التركيز على تلك التي يمكنها رفع مستوى الأداء عبر دورات الحياة هذه». كما حذر روتش من أن هذه التحولات ليست سهلة لتطبيقات المعالجة. ذلك لأنها تستند بشدة إلى الإعدادات المادية، وأشار قائلا: «يكلف العديد من أصول العمليات ما بين 100 مليون و250 مليون دولار أمريكي أو أكثر، وهي معقدة للغاية، بحيث يصعب تطوير تمثيلات رقمية، أو بناء نماذج منها يمكن أن تشير إلى متى تحتاج إلى الدعم أو الصيانة. كما أن التوائم الرقمية للمعدات المادية مكلفة أيضا، ولكن بمجرد حصول المستخدمين عليها، يمكنهم البدء في متابعة نظرائهم الماديين للحصول على أداء أفضل لمهام الهندسة والصيانة والدعم. سيكون هذا الأرجح حيث ستحدث معظم الفوائد».

وأفاد ديف هيدج، مهندس الحلول في شركة إيكسون موبيل لتكنولوجيا المعلومات، بوجود ثلاث مراحل رئيسية للتحويل الرقمي وهي: جمع البيانات الأولية، وأخذها وتعلمها، وتطبيقها مرة أخرى في الميدان، وأن كوفيد-19 قد سارع جميع هذه المبادرات: «إنه لأمر مدهش ما يمكن أن يفعله التحويل الرقمي، لكن السؤال أصبح فجأة» كيف يمكننا إشراك الجميع؟ لذلك، نحتاج إلى العودة إلى اتخاذ قرار بشأن رؤية مشتركة حول ما نحتاج أن نقوم به الرقمنة على أساس استخراج القيمة من عملياتنا».

تبسيط الثقافة

والاستثمار في التحويل

وقد اتفق أعضاء اللجنة - بالإجماع - على أن أحد المكونات الحاسمة للتحويل الرقمي هو تشجيع القبول الثقافي من قبل المشغلين والفنيين والمهندسين والمديرين

غازات الاحتباس الحراري أصبحت مقياسا رئيسيا في المقدمة». وأضاف: «هذا يعني أن على العديد من القادة تبني رؤى أوسع مما كانت عليه في الماضي، وتحقيق التوازن بين أولوياتهم».

وتابع قائلا: «في السابق، كان القادة يتحدثون عن الأفراد، والكوكب، والربحية»، لكن التركيز كان لا يزال منصبا - في الغالب - على الربحية. والآن، عليهم أن يفوا متطلبات جميع الجبهات. ولحسن الحظ، هناك طرق أمام رواد صناعة النفط والغاز ومنظماتهم للقيام بذلك. على سبيل المثال، فكما نستخدم تطبيق Waze للتنقل في رحلتنا، فقد جربنا برنامجا مماثلا يمكنه المساعدة في تشغيل حقول النفط والغاز، ويمكنه تقديم بعض الفوائد المهمة. وبالنسبة للعديد من القادة، كان التركيز أقل على ابتكار تطبيقات جديدة، وأكثر على تكييف البرامج الحالية مع عملياتهم».

التوافق مع الرقمنة

نظرا لظهور العديد من التقنيات المفيدة المحتملة بسرعة كبيرة، ذكر آندي ويذرهي، كبير مسؤولي التكنولوجيا في شركة سينسيا، أن العديد من هذه التقنيات وبنياتها تتقارب. وقال: «على سبيل المثال، يتم دمج قدرات الأمن السيبراني في العديد من المنتجات، مما يجعلها منتشرة». وقد أصبح العديد من التطبيقات افتراضية بشكل متزايد في الوقت نفسه الذي تشارك فيه في مجتمعات البرمجيات مفتوحة المصدر مثل منتدى أهمة العمليات المفتوحة (OPAF)، أو بدأت في استخدام أجهزة استشعار مناسبة للغرض أو مكونات لاسلكية ذاتية التنظيم».

وقال ديساي إن إحدى طرق تنظيم طوفان التكنولوجيا المتغير باستمرار هي التساؤل: «إلى أي غاية؟» والتركيز فقط على تلك التي يمكنها حل مشكلات معينة. وأوضح قائلا: «تمثل المشكلات الحقيقية في إدارة التغيير

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فبراير/شباط

17 - 15 منتدى الشرق الأوسط للتكرير والبتروكيماويات - ME-TECH 2021 افتراضي www.europecrude.com/event/357

أبريل/نيسان

7 - 6 منتدى الإمارات للصحة والسلامة والبيئة 2021 دبي www.hse-forum.com

مايو/أيار

27 - 24 معرض الشرق الأوسط للنفط والغاز - MEOS 2021 المنامة www.meos-expo.com

أغسطس/آب

19 - 16 مؤتمر تقنية حقول النفط البحرية - OTC 2021 هوستون <http://2021.otcnet.org>

سبتمبر/أيلول

15 - 13 معرض عُمان للبترول والطاقة مسقط www.omanpetroleumandenergyshow.com



الرقمنة قد تصبح عنصرا معاونا لقطاع النفط والغاز فيما بعد كوفيد - 19

تعزيز انتشار الرقمنة في قطاع النفط والغاز

تناولت لجنة النفط والغاز، أثناء فعاليات معرض Automation Fair at Home، موضوع التحول في مجال الطاقة والتحديات الرقمية المرتبطة به. فالتحول الرقمي قد يكون إحدى وسائل العون القليلة التي يمكن أن تساعد المنتجين في قطاع النفط والغاز على التعامل مع أسواقهم المتقلبة، والتي تشهد تحولات سريعة تأثرا بفيروس كورونا المستجد (كوفيد-19). ومع ذلك، كما هو الحال مع أي تحول كبير، فإن قول ذلك أسهل من القيام به.

عام 2014 بسبب ضغوط التسعير على المشغلين، مما تسبب في خروج بعض المزودين من الصناعة وإعادة التركيز». وقد أوضح تشيتان ديساي، نائب رئيس التقنيات الرقمية في شركة شلمرجير للمعدات وخدمات حقول النفط، أن هذه التحديات تدفع عملاء الشركة في قطاع التنقيب والإنتاج وقطاع النقل وخطوط الأنابيب إلى زيادة تركيزهم على إدارة المحافظ. وأضاف: «إننا نشهد اختلالات في العرض والطلب، ومخاوف تتعلق بالكفاءة والتكلفة، مما يؤدي إلى زيادة التركيز على إنشاء القيمة الإجمالية، وتكامل أوثق مع مزودي الخدمة لزيادة الجودة، وتقديم قيمة أكبر لمشغلي الأصول. مع التركيز بشكل أكثر حدة على العمليات الحالية، بدلا من استكشاف عمليات جديدة على الحدود».

الحاجة إلى الريادة في اتجاهات جديدة
لمواجهة هذه التحديات الملحمة، أفاد المتحدثون أنه ستكون هناك حاجة إلى مستويات جديدة من الريادة وأخذ زمام المبادرة عبر قطاع النفط والغاز. وصرح واسدن قائلا: «يبدأ هذا حقا برؤية لتحقيق النجاح تتناول الربح والسلامة، بالطبع، ولكن مع الاعتراف أيضا بأن كثافة

مع كوفيد-19- مشابه لحالات الانكماش السابقة. حيث استعنا استرداد الكثير من الانخفاض الأولي في الطلب بنسبة 30 في المائة، لكننا مازلنا في انخفاض بنسبة 5 في المائة إلى 7 في المائة، ومعظم التقديرات تشير إلى أن الطلب سيكون بطيئا في العودة لمستوياته المعتادة. ذلك لأن الكثير من الأشخاص يعملون من المنزل. وفي الوقت نفسه، وعلى الرغم من انهيار الطلب على وقود الطائرات، فإن وقود الديزل يرتفع بسبب وجود الكثير من شاحنات شركة أمازون وشاحنات أخرى تمر عبر الأحياء. وتشير بعض التقديرات إلى أن الطلب سيظل منخفضا بنسبة من 5 في المائة إلى 6 في المائة لمدة 20 عاما، وسيستعين إغلاق بعض مصانع التكرير. ويشير البعض الآخر إلى أن صناعة التكرير قد تنمو بنسبة 20 في المائة بحلول عام 2040، ولكن ستظل هذه الزيادة معدلة 1 في المائة فقط سنويا.

وأردف قائلا: «يتأثر كل هذا بحقيقة أن التكرير هو عمل فريد له تأثير ضئيل أو معدوم على تكلفة المواد أو المنتجات التي ينتجها، ويتعين عليه أيضا التعامل مع العديد من اللوائح ومتطلبات السلامة. ويتمثل هذا التحدي في تحسين المواد الأولية والعمليات، والسعي لتحسين الأداء والصيانة. فلقد حقق جانب الخدمة للتكرير نجاحا كبيرا في

استضاف منتدى صناعة النفط والغاز، وهو جزء من فعاليات معرض Automation Fair at Home، خمسة من خبراء الصناعة لاستكشاف هذه المشكلات والنظر في الحلول الممكنة. فقد صرح فريد واسدن، وهو عضو مخضرم في شركة شيل وعضو إداري في أوبتلتيكس، وهي شركة استشارية تركز على تسريع تحقيق قيمة الأصول من خلال تحليلات البيانات وتنفيذ التكنولوجيا لصناعة الطاقة، قائلا: «إن وتيرة التحول في صناعات الطاقة تتسارع، ولكن هناك أيضا حالة تدهور في الطلب الآن، والذي يعطي شعورا طويلا للأمد يجعله مختلفا عن الأحداث السابقة». وأضاف: «يتمثل الاتجاه الثاني في الارتفاع الهائل في التقنيات الرقمية حسب مستخدمي الصناعة القائمة على العمليات، والتي يتم تبنيها بعد اختبار المخاطر في الصناعات الأخرى. فنحن نواجه أيضا تحديا كبيرا في تعيين الموظفين والاحتفاظ بهم. إنه وقتٌ مثيرٌ، ولكنه من الصعب التعامل مع هذه التغيرات الكثيرة دفعة واحدة».

الانكماش الاقتصادي يؤدي إلى إعادة التركيز
أضاف بال روتش، مستشار الصناعة في قطاع النفط والغاز بشركة روكويل أوتوميشن، قائلا: «الوضع الحالي

المحررة: لويز ووترز

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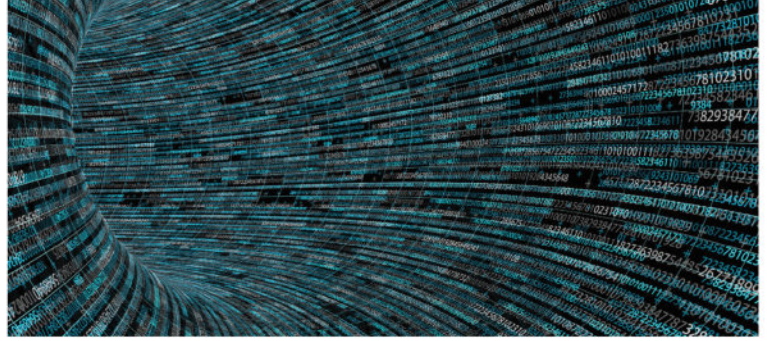
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تحليلات

تعزيز انتشار الرقمنة في قطاع النفط والغاز. ٤

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استطلاعات: سوق أبراج الحفر، استكشاف الغاز، التنقيب عن الغاز، الشحن.

تقنيات: أتمتة المعالجة، التحكم في آبار النفط، التقنيات السيزمية، المكثفات.

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تعزيز انتشار
الرقمنة
في قطاع
النفط والغاز

مواجهة التحول في مجال الطاقة والتحديات الرقمية