

# Oil Review

Oil · Gas · Petrochemicals

Middle East

VOLUME 25 | ISSUE 2 2022

## The latest in pipeline technology

- Bahrain's energy transformation
- The benefits of cogeneration
- Achieving sustainability and business goals with digitalisation
- Closing the operator knowledge gap
- Compressor developments

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## → Editor's note

PROTECTING PIPELINES FROM integrity threats, ranging from corrosion to hot-tapping, is a top priority for oil and gas companies. Combining a DAS monitoring system with integrated UAV technology can create a powerful detection and response system (p28). Our pipeline technology feature also covers a new solution to detect clogs in subsea pipelines and a system to retrieve cleaning devices stuck in pipelines.

Sustainability and emissions reduction are critical concerns now for oil and gas companies, many of which have set ambitious net zero targets. Digitalisation offers the potential to gain actionable insights into assets and processes, enabling better decision making for sustainable operations, as Martin Piesker, head of digitalisation at Siemens Energy, explains (p24). Elsewhere, we cover the latest compressor developments (p26), Bahrain's energy transformation (p14) and the benefits of knowledge automation (p32).

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## → Executives' Calendar, 2022

MARCH			
21-23	<b>Oman Petroleum &amp; Energy Show</b>	MUSCAT	<a href="http://www.omanpetroleumandenergyshow.com">www.omanpetroleumandenergyshow.com</a>
22	<b>Webinar on Operator Knowledge Gap</b>	VIRTUAL	<a href="mailto:khushboo.narang@alaincharles.com">khushboo.narang@alaincharles.com</a>
28-29	<b>Offshore Well Intervention Middle East</b>	DUBAI	<a href="http://www.offsn.net">www.offsn.net</a>
MAY			
2-5	<b>Offshore Technology Conference (OTC)</b>	HOUSTON	<a href="https://2022.otcnet.org">https://2022.otcnet.org</a>
10-12	<b>Med Energy Conference &amp; Exhibition (OMC)</b>	RAVENNA	<a href="http://www.omc.it">www.omc.it</a>
10-12	<b>ME-TECH 2022</b>	DUBAI	<a href="http://www.europetro.com/event/380">www.europetro.com/event/380</a>
16	<b>Middle East Petroleum &amp; Gas Conference</b>	MANAMA	<a href="http://www.mpgc.cc">www.mpgc.cc</a>
SEPTEMBER			
5-8	<b>Gastech</b>	MILAN	<a href="http://www.gastechevent.com">www.gastechevent.com</a>
6-7	<b>MENA HSE Forum</b>	DUBAI	<a href="http://www.hse-forum.com">www.hse-forum.com</a>
OCTOBER			
30-3 Nov.	<b>ADIPEC</b>	ABU DHABI	<a href="http://www.adipec.com">www.adipec.com</a>

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

### Oman's largest oil, gas and energy event to take place in March

MORE THAN 350 companies from 22+ countries are set to exhibit at the Oman Petroleum & Energy Show (OPES) to be held from 21-23 March at the Oman Convention & Exhibition Centre, Muscat. It is the only event in Oman that serves the entire oil and gas industry. Held under the patronage of the Ministry of Energy and Minerals (MoEM), with Petroleum Development Oman (PDO) as host, OPES provides an effective business and networking platform, serving as a key meeting point for energy professionals, oil and gas companies, policy and decision makers, and stakeholders. International and domestic players taking part include PDO, QatarEnergy, BP, Halliburton, Shell, Occidental Oman (Oxy), Schlumberger, ARA Petroleum, Ray International Oil & Gas, Petrojet and more.

The conference, organised by the Society of Petroleum Engineers (SPE) under the theme of 'Shaping the Future of the Energy Industry' features highly acclaimed expert speakers who will convene to exchange ideas and insights through informative discussions and technical presentations on key topics shaping the current and future of the industry. Topics covered include gas exploration, production offshore drilling and field development, IOR/EOR methods, offshore emerging technologies, HSE and asset management, digitalisation, artificial intelligence and machine learning, among



Image Credit: OPES

*OPES is expected to feature more than 350 exhibiting companies.*

others. Speakers include high-profile representatives from the Ministry of Energy & Minerals, Petroleum Development Oman, Saudi Aramco, ENI Oman, MB Holding and National Oilwell Varco.

New for this edition is the Digital Oil & Gas Zone, a showcase of the latest technology required to assess and ascertain winning digitalisation strategies and advancements in handling the current and future challenges of

Oman's upstream, midstream downstream and retail sector of the oil and gas industry. The zone will unite industry professionals to discuss digital and technological solutions for developing business. Digital technologies shaping the future of the oil and gas industry will be discussed in the Digital Oil and Gas Talks.

*For further information see the website at [www.omanpetroleumandenergyshow.com](http://www.omanpetroleumandenergyshow.com)*

## OWI ME 2022 set for success

A FULL HOUSE is expected for OWI ME 2022, the Middle East's leading well intervention conference, to take place from 28-29 March in Dubai. More than 25 expert speakers will provide insight on the most business-critical topics and share new best practices from current and past projects, allowing attendees to optimise intervention strategies using the latest technologies, maximise well operation efficiency and hit the ground running post-pandemic. The Middle East's major operators and service providers have already booked their place including ADNOC, Archer, BP, Dragon Oil, Halliburton and Schlumberger.

Join them now: <https://offsnet.com/owi-me/registration>

For more information and for group discounts, please reach out to Rachael Brand, project manager, Offshore Network. t: +44 (0) 20 3409 3041 | e: [rbrand@offsnet.com](mailto:rbrand@offsnet.com) | [www.offsnet.com](http://www.offsnet.com)

## Quick Q&A - Tural Yusubov, senior engineer, Integrity, ADNOC

### To what extent are ageing fields an issue in the Middle East?

Every year, ADNOC and government agencies increase the focus on well integrity management across all fields. In addition, UAE cities are continuously expanding in all directions, including to the old oil fields. I think over the next 10 years, we should expect more focus on well integrity.

### What well integrity management strategies can be employed to prepare mature wells and tackle ageing field abandonment?

I think the most important thing is data management. Once the required data is available at a specific point of time, then a specialised programme can be developed for different fields, since each area may have its own specific challenges, and the programme should be able to address those challenges.



Tural Yusubov, ADNOC.

Image Credit: ADNOC

### Are there any new technologies or techniques that you think offer exciting possibilities in terms of well integrity relating to ageing fields?

Today, we see some technologies in the market that offer techniques for well diagnostics and barrier placing without a major workover, and even without a well intervention. If we look back 10-15 years, a barrier failure posing a high risk would require a major workover. Unfortunately, the number of such technologies is limited in the market. We would like to see more diagnostic and repair methods involving minimum footprint and well downtime.

### What are the most effective ways of placing barriers for well abandonment?

For sure, effective barrier placement goes back to proper design and execution.

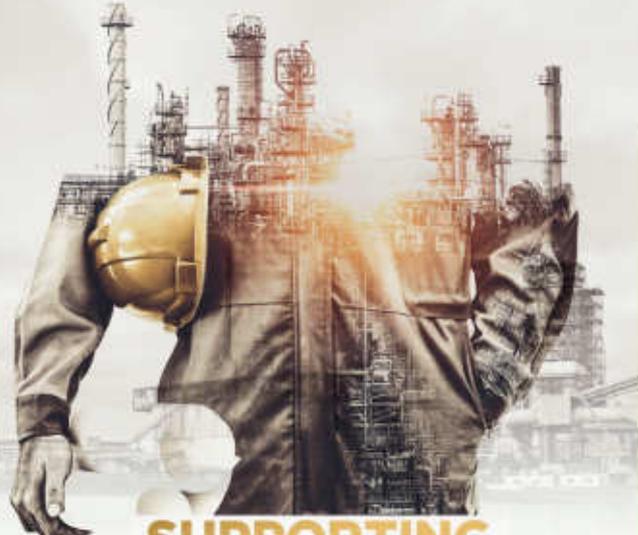
Tural Yusubov will be moderating a panel session on Plug & Abandonment at OWI Middle East.



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# Debating the future of the oil & gas industry

The future of oil and gas, the energy transition and energy inclusivity were important themes at the International Petroleum Technology Conference (IPTC) held in Riyadh from 21-23 February.

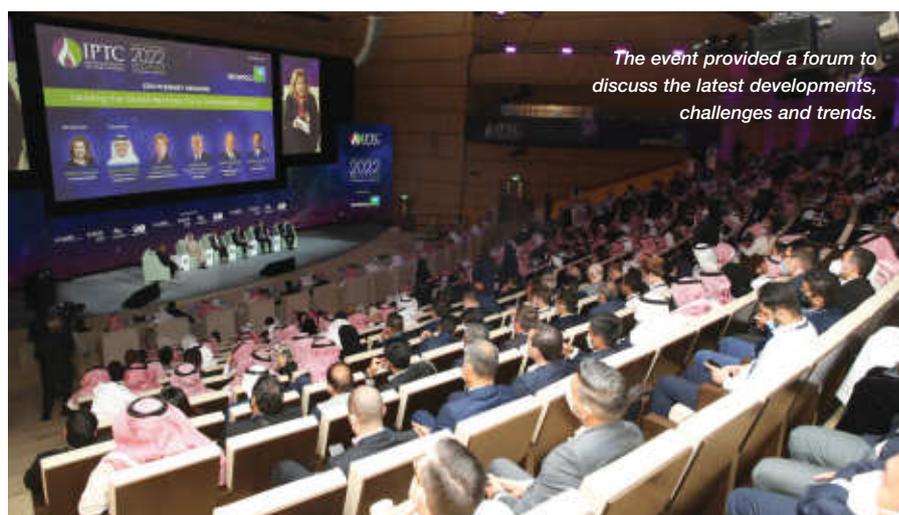
**T**HE THREE-DAY CONFERENCE and exhibition, hosted by Aramco, brought together industry leaders and experts, energy professionals, academia, and students, to discuss, debate, and share insights about the latest developments, challenges, and trends in the industry. More than 220 exhibitors showcased their latest products and innovations.

In the CEO Plenary Session, themed 'Leading the Global Recovery for a Sustainable Future', Amin H. Nasser, president and CEO, Saudi Aramco said, "We need to have better engagement to work together with the support of policy makers around the world. Demonising the industry is not going to solve anything, and this is what is happening today. We need to ensure there is adequate investment, there is decarbonisation with support of regulators. You cannot look only at alternatives; you need to work in parallel and look at existing energy sources and new energy sources. And unless you have a plan B fully done and completed and ready, you cannot ditch plan A."

Ahmed Al-Khowaiter, Aramco's chief technology officer, highlighted the benefits of the circular carbon economy model, also emphasising the importance of increased transparency across the industry:

"A circular carbon economy is how we transition from today to a low carbon future in a technology-agnostic way that encompasses all players holistically and unleashes the power of the existing energy industry. It is the most economical thing to do, not only the quickest. There is a huge potential to reduce emissions from the global oil and gas industry, not just through renewables but also through good gas management and petroleum engineering practices. We need regulators to recognise good performance and incentivise transparency because it is good for both our industry and society at large."

Aramco's executive director of strategy & market analysis, Ashraf Al-Ghazzawi, said, "We all know that as the world transitions to a low-carbon economy, there is going to be a



*The event provided a forum to discuss the latest developments, challenges and trends.*

Image Credit: IPTC

fundamental change in our energy infrastructure, our energy systems, and how energy is utilised around the world. A one-size-fits-all approach to the energy transition will not work. Developing countries will need to ensure they have affordable access to energy, and an inclusive transition is one that will ensure all parties are in it together."

Nabil Al-Nuaim, vice president – Digital Transformation, Aramco, said that the evolution of Saudi Arabia's digital ecosystem, including cloud computing, would help to turbocharge innovation across the energy sector while supporting the sustainability and decarbonisation agenda. "Digital transformation has changed our lives and it will continue to bring disruption and added value to our societies. At Aramco, part of our digital transformation agenda is to create a world class 'digital ecosystem' to support our core business and expand for the future. Building this ecosystem is not easy – it takes years of hard work with our partners. We are confident that this will lay the foundations of another Silicon Valley for the energy sector."

Olivier Le Peuch, CEO, Schlumberger, said, "We have a challenge, but I think we can turn it into an opportunity. We can contribute to

accelerate the decarbonisation of oil and gas through technology and it's not only the shift from oil to gas; I believe it's using technology at every step of the upstream, midstream and downstream to decarbonise operations...If we do that well, our industry will not only thrive in the future, but we'll survive and be more resilient than we ever anticipated to be."

Clay Neff, president, Chevron Middle East, Africa, South America Exploration and Production Company, said, "All forms of energy are going to be needed. Oil and gas is going to be a critical part of the mix; any rational analysis of the future sees oil and gas as continuing for decades to come, but we are going have to do that in a responsible way. We are going to have to continue to drive down emissions and while we are doing that, we have to continue to build these scalable material businesses like hydrogen, carbon capture and renewable fuels and others...We are optimistic about the future. I think that as much difficulty we've been through in the last couple of years, optimism drives creativity, innovation and sound risk-taking, which is going to require all of us working together to navigate through this energy transition." ■

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## Halliburton opens its first oilfield specialty chemical manufacturing reaction facility

HALLIBURTON COMPANY, A multinational oil field services company, has opened its first oilfield specialty chemical reaction plant – the first of its kind in Saudi Arabia to manufacture a broad range of chemicals for the entire oil and gas value chain as well as many other industries.

The facility expands Halliburton's manufacturing footprint in the eastern hemisphere and aims to strengthen and accelerate its ability to serve the chemical needs of Middle East customers.

In addition to manufacturing, the facility allows Halliburton to expand its specialty chemicals research and applications for oilfield stimulation and production. The company is now better equipped to serve the region's industrial water and process treatment markets, including refineries, petrochemical plants, and other heavy industrial operations.



Image credit: Halliburton

*The plant aims to advance Halliburton's growing presence in the local market.*

## Sergas Group and Royal Strategic Partners sign strategic agreement

SERGAS GROUP, A gas services provider, has signed a strategic partnership agreement with Royal Strategic Partners, an affiliate company of Strategic Investment Capital that specialises in investment, development, establishment and management of real estate projects. The agreement aims at enhancing infrastructure in the gas sector in the MENA region and other areas.

The agreement signing took place at the Sergas Abu Dhabi Group headquarters and by Dr Hamad Al Ali, CEO of Royal Strategic Partners and Mohamed Damak, CEO of Sergas group.

Dr Hamad Al Ali said on this occasion, "We are proud of this partnership with Sergas group and the agreement will achieve great economic value for both parties."

Mohamed Damak remarked that the partnership is of great importance to both companies as it enhances strategic plans in line with GCC vision 2020-2030 and commitment for shared sustainable growth in the gas sector.

Through this partnership, Sergas Group will be able to expand its existing portfolio of 7,500 projects across the GCC region, which currently supplies more than 30,000 metric tons of LPG annually.

## OEM Group wins a seven-figure contract in partnership with Sigma Engineering Works

OILFIELD SERVICE COMPANY OEM Group (OEM), in partnership with Sigma Engineering Works LLC (SEW), an engineering services company, has secured its second seven-figure contract with the largest oil and gas producer in the UAE, bolstering its track record in the Middle East market.

The five-year contract will see OEM provide services including inspection, repair, corrective and preventative maintenance, supply of spare parts for diesel engines and diesel driven equipment. OEM said that the work will be carried out on a number of offshore drilling platforms in Abu Dhabi as well as the surrounding islands.

OEM's partner in the region, Abu Dhabi-based Sigma Engineering Works, is known to provide in-house services including testing, fabrication, and refurbishment.

Founder and managing director of OEM, Barry Park, said, "The Middle East market has remained a strong focus for the group and this contract award is a superb addition to the group's growing track record in the region, as we continue to increase our market share."

Olaf Grimm, general manager at Sigma, said that the contract partnership will unify the technical expertise of both SEW and OEM in fulfilling an efficient delivery of services towards a trusted and successful collaboration.



Image credit: OEM Group

*Barry Park, founder and managing director of OEM and Olaf Grimm, general manager at Sigma.*

## Aramco closes gas pipeline deal with global investor consortium

SAUDI ARABIAN OIL Company (Aramco) and an international investor consortium, led by affiliates of BlackRock and Hassana, have closed the lease and leaseback deal previously announced on 6 December 2021.

The consortium has acquired a 49% stake in Aramco Gas Pipelines Company, a subsidiary of Aramco, for US\$15.5bn. The consortium is said to be comprised of leading institutional investors including, amongst others, Keppel Infrastructure Trust, Silk Road Fund and China Merchants Capital.



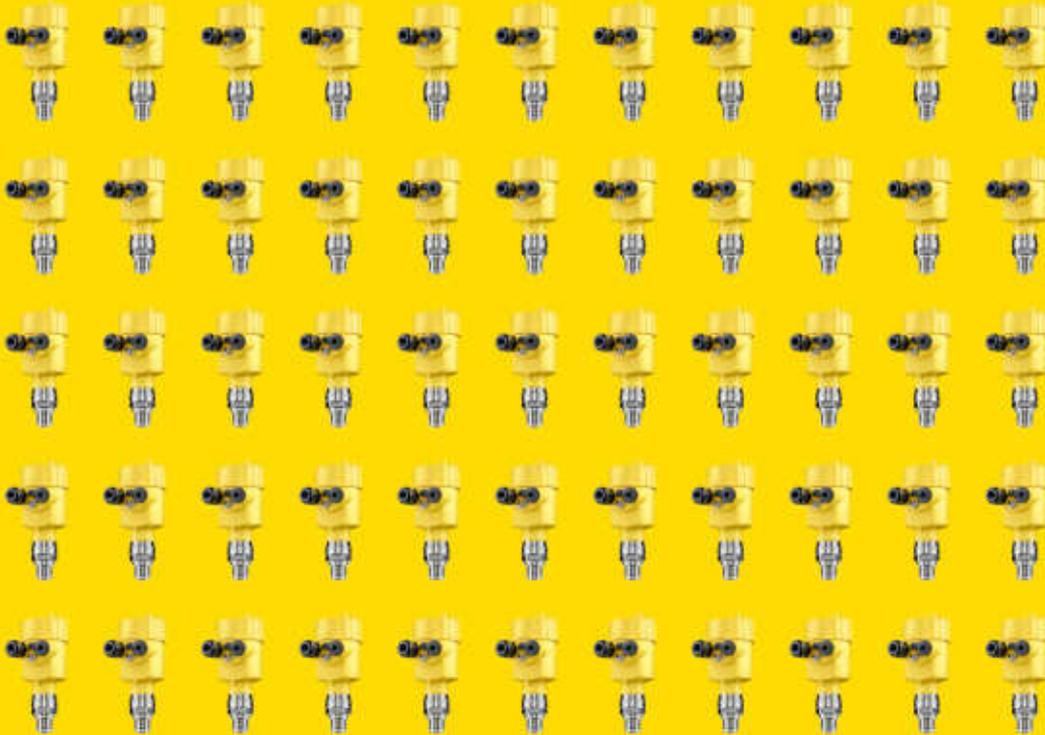
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*The long-term investment by the consortium represents further progress in Aramco's portfolio optimisation programme.*

This long-term investment by the consortium represents further progress in Aramco's portfolio optimisation programme and highlights the strong investment opportunities presented by Aramco's significant infrastructure assets. It also underlines Aramco's strong long-term outlook and the appeal of the Kingdom of Saudi Arabia to leading institutional investors.

Under this arrangement, Aramco Gas Pipelines Company will receive a tariff payable by Aramco for the specified gas products that flow through the network, backed by minimum commitments on throughput. Aramco retains a 51% majority stake in Aramco Gas Pipeline Company and also retains full ownership and operational control of the gas pipeline network. The transaction does not impose any restrictions on Aramco's production volumes.

Aramco president and CEO Amin H Nasser said, "The participation of the consortium led by BlackRock and Hassana underlines the appeal of Aramco's portfolio to leading global investors as Saudi Arabia's economic transformation builds momentum, requiring a robust energy infrastructure and network that are vital to meet the needs of an expanding industrial sector."



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## Enteq launches technology centre to drive SABER Tool development

ENTEQ TECHNOLOGIES, THE energy services technology and equipment supplier, has opened its new technology centre in Andoversford, near Cheltenham, in the UK to drive the development of its innovative SABER Tool.

The centre's launch follows successful downhole and system testing of the new SABER Tool, an innovative alternative to traditional rotary steerable systems (RSS) for directional drilling. Housing a team of engineers, the dedicated technology centre will allow the company to continue development of the tool ahead of full commercialisation in 2022.

The SABER Tool is an evolution of the proof of concept, tested by Shell and licensed to Enteq, representing a step-change in directional drilling technology. The Enteq team, which has expanded rapidly in response to its product development and global growth ambitions, has re-engineered the concept resulting in a mechanically simple, plain collar and compact design that promises excellent control and new levels of reliability.



The SABER Tool.

Image Credit: Enteq Technologies

## Endress+Hauser establishes sales office in Oman

ENDRESS+HAUSER, THE SWISS specialist in measurement and automation technology, has opened a new sales office in Muscat, Oman, to strengthen its support to customers on the Arabian peninsula across all industries.

The office started operations in January 2022 and is headed by country manager Haitham Al Rawahi. He brings 15 years of experience in oilfield operations, corporate development and sales with national and international companies, and is a graduate of the government's Etimad Senior Leadership Program for executives. The team in Oman receives administrative support from Endress+Hauser International in Reinach, Switzerland, and Endress+Hauser Middle East, based in Dubai, UAE.

Endress+Hauser has been working successfully in the Omani market for two decades, supporting customers in all major industries. With the opening of the sales office, the Swiss group of companies is now able to further expand its local offering of products, solutions and services to help customers use their installed base even more efficiently.

## TA'ZIZ and Proman partner to develop methanol facility in Ruwais

ABU DHABI NATIONAL Oil Company (ADNOC) has signed an agreement with Proman, one of the world's leading producers of methanol, to develop the UAE's first world-scale methanol production facility at the TA'ZIZ Industrial Chemicals Zone in Ruwais, Abu Dhabi.

Under the terms of the agreement, Abu Dhabi Chemicals Derivatives Company RSC Ltd (TA'ZIZ) and Proman will construct a natural gas to methanol facility with an anticipated annual capacity of up to 1.8mn tons per annum.

The facility will meet growing domestic and international demand for this clean and versatile chemical commodity which is gaining momentum as a lower-emission fuel alongside existing uses spanning industrial products. The project is subject to relevant regulatory approvals.

HE Dr Sultan Ahmed Al Jaber, UAE minister of industry and advanced technology and managing director and Group CEO of ADNOC, said, "As Proman's first investment in the UAE, our agreement underscores the continued appeal of the UAE as a highly attractive destination for international capital, supporting long-term industrial growth for Abu Dhabi's private sector."

David Cassidy, Proman chief executive, said, "Growing global interest in methanol as a cleaner fuel, particularly for the shipping sector, is set to drive a significant increase in worldwide methanol demand over the coming decade."



The facility will meet growing domestic and international demand for this clean and versatile chemical commodity which is gaining momentum as a lower-emission fuel alongside existing uses spanning industrial products.

Image Credit: ADNOC

## IEA: Energy sector methane emissions 70% higher than official figures

GLOBAL METHANE EMISSIONS from the energy sector are about 70% greater than the amount national governments have officially reported, according to IEA analysis.

Methane is responsible for around 30% of the rise in global temperatures since the Industrial Revolution, and quick and sustained emission reductions are key to limiting near-term warming and improving air quality. Methane dissipates faster than carbon dioxide (CO<sub>2</sub>) but is a much more powerful greenhouse gas during its short lifespan, meaning that cutting methane emissions would have a rapid effect on limiting global warming.

The energy sector accounts for around 40% of methane emissions from human activity, and this year's expanded edition of the IEA's Global Methane Tracker includes country-by-country emissions from coal mines and bioenergy for the first time, in addition to continued detailed coverage of oil and natural gas operations. Methane emissions from the energy sector grew by just under 5% last year.

"At today's elevated natural gas prices, nearly all of the methane emissions from oil and gas operations worldwide could be avoided at no net cost," said IEA executive director Fatih Birol.

"The International Energy Agency has been a longstanding champion of stronger action to cut methane emissions. A vital part of those efforts is transparency on the size and location of the emissions, which is why the massive underreporting revealed by our Global Methane Tracker is so alarming."

"The Global Methane Pledge must become a landmark moment in the world's efforts to drive down emissions," said Dr Birol. "Cutting global methane emissions from human activities by 30% by the end of this decade would have the same effect on global warming by 2050 as shifting the entire transport sector to net zero CO<sub>2</sub> emissions."

European Commission executive vice-president Frans Timmermans said, "Methane is the second biggest contributor to global warming. Rapidly cutting methane emissions is therefore a key part of our efforts to tackle the climate crisis. As established in the Global Methane Pledge, we need more precise data on actual methane emissions. By measuring, reporting, and verifying, we will know where emissions cuts are most urgent. The IEA's report underscores the necessity of this effort."



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## Pasqal and Aramco collaborate on quantum computing

PASQAL, A DEVELOPER of neutral atom-based quantum technology, and Aramco have announced the signing of an MoU to collaborate on quantum computing capabilities and applications in the energy sector.

Objectives include accelerating the design and development of quantum-based machine learning models as well as identifying and advancing other use cases for the technology across the Saudi Aramco value chain. To that end, both companies plan to explore ways for collaborating and cultivating the quantum information sciences ecosystem in the Kingdom of Saudi Arabia.

Quantum computing can be used to address a wide range of upstream, midstream and downstream challenges in the oil and gas industry, including network optimisation and management, reaction network generation and refinery linear programming. The collaboration will explore potential applications for quantum computing and artificial intelligence in these areas as well.



The signing of the MoU.

Image credit: Pasqal

## New report highlights digital transformation gains

LARGER MULTINATIONAL OIL and gas companies and smaller SMEs have different needs and must have different approaches to digital transformation, according to a report titled *The Digital Transformation in the Oil & Gas Industry* by Saudi management consultants, Strategic Gears.

The report recommends that for large multinationals, global leaders must pave the way in developing profitable solutions through analysing their own operations. The report also suggests that transformation must occur to realise the profitability gains at stake, and that companies need to evaluate where they stand on the maturity of the required technologies, as this will determine the focus areas for investment.

For SMEs, the report highlights a focus on technologies that are proven to increase efficiency, production, and safety. Examples of technologies identified as areas to focus on include robotics, advanced sensors, big data analytics, and connectivity. These technologies are beginning to mature and are the most important focus areas for SMEs, given their direct impact on their productivity and bottom lines.



The report recommends different approaches for digital transformation.

The Strategic Gears report also sheds light on the applicable technologies to be adopted in the oil and gas industry from those used in financial services, manufacturing, healthcare and transportation. The applicable technologies include robotic process automation and blockchain for large multinationals; and for SMEs, the report highlights AI & ML, IoT, cloud, big data, robotic process automation and blockchain.

The report also presents case studies by Strategic Gears' partner, Nexus Frontier Tech, illustrating how digital technologies can improve operational excellence. These include AI-assisted corrosion detection, which results in a faster inspection process and lower cost; AI-assisted image screening, which offers a faster process of screening images; and AI-assisted safety compliance, which leads to faster and more accurate detection and higher levels of compliance, as well as lower costs.

Image credit: Adobe Stock

## New methane emissions reduction initiative

THE OIL AND Gas Climate Initiative (OGCI), which consists of 12 global oil and gas majors representing around 30% of the world's total oil and gas production, has launched the Aiming for Zero Methane Emissions Initiative.

The initiative calls for an all-in approach that treats oil and gas methane emissions as seriously as the industry already treats safety: aiming for zero and striving to do what is needed to get there. Signatories to the Aiming for Zero Methane Emissions Initiative believe that virtually all methane emissions from the industry can and should be avoided, building on the following:

1. Striving to reach near zero methane emissions from their operated oil and gas assets by 2030, and encouraging partners to achieve similar results.
2. Putting in place all reasonable means to avoid methane venting and flaring, and to repair detected leaks, while preserving the safety of people and the integrity of operations.
3. Reporting annually and transparently on their methane emissions.
4. As technology evolves, deploying more monitoring and measurement technologies, and introducing new solutions to avoid methane emissions.
5. Supporting the implementation of sound regulations to tackle methane emissions and encouraging governments to include methane emissions reduction targets as part of their climate strategies.

This leadership initiative supplements important multi-stakeholder initiatives, such as the Methane Guiding Principles, the Oil and Gas Methane Partnership 2.0 and the Global Methane Alliance.

OGCI remains committed to its methane intensity target of well below 0.20% by 2025 and will be reviewing its shared targets for 2025 and onwards to account for this new initiative and its new strategy launched in September 2021.

"We recognise that eliminating methane emissions from the upstream oil and gas industry represents one of the best short-term opportunities for contributing to climate change mitigation and for advancing the goals of the Paris agreement," said OGCI Chair, Bob Dudley. "The time has come for us to go further, and we believe that the oil and gas industry can and should lead this effort."

Following the announcement, Schlumberger announced the launch of Schlumberger end-to-end emissions solutions (SEES), with an aim of providing a comprehensive set of services and cutting-edge technologies designed to give operators a robust and scalable solution for measuring, monitoring, reporting and eliminating methane and routine flare emissions from their operations.



The initiative calls for an all-in approach to reducing methane emissions.

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# Bahrain's energy transformation

Bahrain's energy infrastructure is being upgraded and modernised as the country transitions to a new era, where production and environmental performance get equal billing. Martin Clark reports.

**W**HILE BAHRAIN IS a small player in the Gulf's overall oil and gas mix, its own energy sector remains integral to the country's domestic economy and its forward prospects. It is an industry that has been through a period of restructuring and consolidation, but one that remains firmly state-controlled, via the Oil & Gas Holding Company (Nogaholding), the kingdom's hydrocarbon and energy investment and development arm.

It controls Bahrain Petroleum Company (Bapco), historically the prime mover in the nation's energy sector, as well as an expanding portfolio of subsidiaries, including Tatweer Petroleum, which is overseeing the redevelopment and growth of the Bahrain field, and Bahrain LNG, a consortium of companies managing the local receiving and regasification terminal.

The onshore Bahrain field is the nation's largest, producing around 40,000 bpd, although the country gets the bulk of its crude oil via the offshore Abu Safah field, which it shares with Saudi Arabia. This contributes a further 150,000 bpd, which is mainly sent for processing into fuels and products at the Sitra refinery, currently in the final stages of a major modernisation and refurbishment.

As part of the broad Bapco Modernisation Program (BMP), the refinery's crude capacity is being increased from 267,000 bpd to 380,000 bpd, with a US\$4.2bn contract awarded to TechnipFMC, Samsung Engineering and Tecnicas Reunidas to lead the work in 2017. This project – which is also intended to improve energy efficiency, valorisation of the heavy part of the crude oil barrel (bottom of the barrel), and enhance the product slate and improve environmental performance – is scheduled for completion during the coming year.

Last August, Bapco awarded its largest catalyst management deal ever to a US joint venture of specialty chemicals group W. R. Grace & Co. and energy giant Chevron to provide its Resid Hydrocracking catalyst and full-cycle catalyst management (FCM)



Image Credit : Adobe Stock

*Bahrain's energy sector remains integral to the country's domestic economy and future prospects.*

solutions at the expanded refinery site. When fully operational in 2023, the new Resid Hydrocracking unit – known as 1RHCU – will be the main profit centre for the refinery. The new hydrocracking unit will convert 78% of the vacuum residue feed into intermediate products, which will then be further processed into high-margin kerosene and diesel, according to Bapco's chairman and chief executive Dr Dawood Nassif, on announcing the five-year contract.

## Upstream developments

The expansion and modernisation of the refinery dovetails with upgrades elsewhere in Bahrain's energy infrastructure. The new

Arabia-Bahrain (AB) oil pipeline was commissioned a few years ago, boosting the flow of crude oil in from Saudi Arabia in readiness for the project. At the same time, the development of domestic reserves is a top priority with Tatweer Petroleum seeking to maximise output from the Bahrain field, which was first discovered back in 1932. Engineering group Petrofac is currently working on a multi-million dollar contract to support Tatweer Petroleum in rolling out a gas distribution network project in Bahrain, which includes high pressure pipelines and fibre optic cabling.

The underground pipelines will run through sections onshore and offshore below the seabed in support of gas supply to the kingdom – it reflects the nation's growing gas interests on top of its traditional oil production. This follows a separate Petrofac contact in 2020 for an upstream gas project that includes well hook-ups, associated pipelines, and tie-ins for several new gas wells that Tatweer Petroleum is drilling as part of its gas delivery strategy in the Bahrain field.

While the energy industry remains heavily

“ The refinery's crude capacity is being increased from 267,000 bpd to 380,000 bpd.”

state-owned, Bahrain has not been shy in forging partnerships with international players to prise open new exploration and production areas.

Tatweer Petroleum itself emerged following a partnership with the US' Occidental Petroleum. More recently, Eni signed up to explore Bahrain's Block 1, after an initial joint study dating back to 2016, and is now looking at the offshore area in the country's northern territorial waters, where depths range from 10 metres up to 70 metres.

There are plans to tap into Bahrain's huge shale oil potential following the 2018 discovery of the Khaleej al-Bahrain field. Located off Bahrain's west coast, and with estimated reserves of around 80 billion barrels of tight oil, it is thought to be the nation's largest hydrocarbon find since 1932. There are hopes of bringing first production on

stream by next year, according to Oil and Gas Minister, Sheikh Mohammed bin Khalifa al-Khalifa, though plans have been delayed in the search for a joint investor and a technical partner.

The new field could have the potential to massively upgrade domestic production, although clear challenges remain.

### Environmental priorities

The recent agreement with Eni broadens the Italian major's work across Bahrain, which also encompasses activities in LNG and renewable energy. That includes a partnership with its environmental division, Eni Rewind, to collaborate in joint initiatives for the recovery of soil, water and waste resources.

As Bahrain progresses its upstream and downstream refining ambitions with some vigour, it is seeking to transition its energy sector onto a more sustainable footing, too.

Environmental, social and governance (ESG) initiatives are now front and centre of nogaholding's planning right across the industry. In February, two of the country's industrial giants, Bapco and Aluminium Bahrain B.S.C. (Alba) – the first aluminium smelter in the Middle East Alba and the

world's largest outside of China – joined forces to share knowledge and collaborate on implementing key ESG initiatives. It reflects a growing trend across Bahrain and indeed elsewhere in the Gulf.

A month earlier, Alba signed a memorandum of understanding (MoU) with Mitsubishi Heavy Industries to collaborate on opportunities to reduce the giant smelter's carbon footprint.

The MoU, a first-of-its-kind with an aluminium producer, lays the foundations to conduct a feasibility study on utilising technology to capture carbon from flue gas, as part of efforts to reduce Alba's overall plant emissions and boost decarbonisation.

"Environment, social and governance matters are fronting everything we do in Alba," said Shaikh Daij bin Salman bin Daij Al Khalifa, Alba's chairman of the board. With production on the rise, that will be a double challenge – Alba broke its own operational records last year with total output of 1,561,222 metric tonnes during 2021.

It's a sign of a resurgent confidence in Bahrain's overall energy sector – one of the Gulf's oldest producers, but with new-found ambitions for the future. ■

“ There are also plans to tap into Bahrain's huge shale oil potential.”



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# Fuelling the energy transition

Rachel Schelble, head of corporate carbon management and infrastructure at Wood Mackenzie, looks at what midstream operators can do to support the energy transition.

**T**HE MIDSTREAM OIL and gas industry will play a central role in the energy transition. Operators have a unique opportunity to enable the shift to low-carbon energy by connecting new and emerging value chains. To do so profitably and sustainably, midstream players will need to adjust their mindset and leverage their infrastructure in new ways.

## Enabling the use of renewable fuels

The midstream industry participates in the renewable fuels value chain in two ways: transportation and blending of renewable natural gas (RNG) into its pipelines, and the production and distribution of renewable diesel.

There is still much to be learned about the project economics of transitioning to renewable fuels. However, midstream operators are actively testing these new business models and progress is being made. Williams, Enterprise, and ONEOK are already blending RNG – biogas sourced from dairy waste and water treatment facilities – into their natural gas streams, for example. Meanwhile, Marathon and Phillips 66 are reconfiguring refineries to produce renewable diesel, with more facilities in the process of retrofit.

## CCUS infrastructure, projects and partnerships

Midstream companies are well placed to play a significant role in the full carbon capture, utilisation and storage (CCUS) value chain. First and foremost, operators can capture carbon dioxide at their own facilities. Firms can also employ their expertise to build, own and operate greenfield infrastructure. By developing sequestration partnerships, they can ensure captured carbon is either used or stored permanently.

“Midstream companies are well placed to play a significant role in the full CCUS value chain.”

Perhaps most interestingly, midstream operators can potentially repurpose existing, underutilised transmission assets to compress and transport CO<sub>2</sub>. However, carbon dioxide needs to be transported at pipeline pressures between 1,200 and 2,200 psi. With crude pipelines operating at 600-1,000 psi and natural gas pipeline pressures ranging from

500-1,400 psi, significant upgrading may be needed.

Despite these issues, several projects and collaborations are already in the works. Williams is capturing emissions at its plants and facilities, for example, while Enlink, Enbridge and Enterprise are partnering with others on sequestration projects.

## Providing hydrogen infrastructure

Low-carbon hydrogen production has huge potential. However, there is a limited liquid market for hydrogen today and no widespread transportation infrastructure in place. Midstream companies have an opportunity to leverage their natural gas pipelines, but there are issues. For one thing, hydrogen can make steel pipelines brittle. What is more, as hydrogen molecules are smaller than methane it is more permeable, with a greater risk of leakage.

As the midstream adapts to the energy transition challenge, finding ways to repurpose old infrastructure for hydrogen production and transportation is an opportunity for strategic differentiation. It will call for an entrepreneurial outlook and a willingness to pursue creative partnerships.

We're already seeing examples of this collaborative approach. MPLX is part of a

consortium developing a joint vision for a hydrogen hub in the Northern Appalachian region of the USA, for example. The alliance brings together companies at the forefront of different parts of the hydrogen value chain, including EQT, Equinor, GE Gas Power, Marathon Petroleum, Mitsubishi Power, Shell Polymers and US Steel. The project includes hydrogen production and utilisation with a focus on CCUS and will develop solutions to decarbonise the steel industry.

Elsewhere, pilot projects are underway to blend hydrogen into the natural gas stream and enable hydrogen utilisation. Enbridge, in partnership with Cummins, brought a hydrogen blending project online in Ontario in January, for example.



Image Credit: Wood Mackenzie Corporate Service

“Technology and capital are ready for a faster transition.”

**Midstream can play a pivotal role in the energy transition**

Tackling climate change effectively will mean coordinating a variety of solutions. For the energy transition to succeed, the different

elements of multiple new energy business models must be efficiently linked.

The midstream industry is in a unique position to bring some of these pieces together. ■

**DNV report highlights optimism for energy transition**

ENERGY INDUSTRY LEADERS say the energy transition is accelerating faster than ever, and that 2022 is set to be a strong year for industry growth, according to a new global report from DNV analysing the views of more than 1,000 senior energy professionals.

Senior industry players from across power, renewables, and oil and gas believe the huge commercial opportunities presented by the transition outweigh the risks to their businesses, according to *The Power of Optimism: Managing scale and complexity as the energy transition accelerates*.

Energy leaders are finding most confidence from their own companies’ strategies within renewables and low-carbon gas, followed by expectations for supportive policy changes and reforms. Confidence for growth is highest among power and renewables companies, and while it is lower in oil and gas, the sector has bounced back from a crash in confidence.

Skills shortages are the greatest barrier to growth for the energy industry, followed by a lack of policy support. Renewables players say permitting and licensing issues are the greatest barrier to growth, and the power and renewables sectors both point to supply chain pressures as a significant barrier. Almost two thirds of the energy industry believes that supply chain issues are slowing down the energy transition.

“We see an optimistic energy industry: confident about growth, boosting investment, and making critical strategic decisions in the energy transition. But we also see significant concerns about barriers to progress – from a skills shortage, to policies, financing, supply chains, and permitting – as the enormous task of transforming the energy system gathers pace,” says Ditlev Engel, CEO, Energy Systems at DNV.

Maintaining reliable energy supply is also a concern, with many in the oil and gas industry convinced that not enough is being invested in exploration and upstream expansion to meet future demand. Some 38% of oil and gas respondents say that their organisation is finding it increasingly difficult to secure reasonably priced finance for projects.

“The world is not on track to meet the targets of the Paris Agreement. We can and must do much more to transition faster to a deeply decarbonised energy system,” says Engel. “We see

complexities in timing the transition, and in matching the scaling down of fossil fuels with the scaling up of clean energy – in terms of raw total energy, but also in its affordability and reliability. The solution is to scale up clean energy much, much faster.”

Expectations are on the rise for large, capital-intensive projects to be approved in the year ahead, while almost half of the industry expects their organisation to increase capital expenditure.

Green hydrogen is the specific technology that the greatest number of energy companies are targeting for increased investment in 2022, followed by solar PV, floating offshore wind, and carbon capture and storage (CCS).

Much of the industry is increasing investment in decarbonisation, but only 42% are optimistic about their company reaching its decarbonisation targets.

Many in the industry believe COP26 did not achieve enough, and that policy failures are holding back greater action on climate change. Less than half say net zero targets in the country or territory where their business is based are realistic and achievable. The industry finds agreement on rules for a global carbon market the most welcome and encouraging outcome of COP26.

“For now, we see a mismatch between the industry’s shorter-term optimism and the world’s longer-term progress on decarbonisation,” says Engel. “The priority needs to be reducing greenhouse gas emissions. Technology and capital are ready for a faster transition. It is policy and a lack of actionable regulatory plans that are holding back a clean energy future.”

Energy companies will increase the scale and spread of their collaboration in the year ahead, working with new stakeholders as they to adapt to the energy transition.

“New partnerships are forming as the energy industry develops new value chains in areas such as hydrogen, CCS, and energy storage. Innovation and digitalisation are playing central roles as the industry looks to scale technologies and manage the growing complexity in the energy system – from the decentralisation of energy generation and storage, to the variability of renewables, to the diversity of inputs integrated with gas and electricity networks, transport, and industrial processes,” says Engel.

# High hopes for hydrogen

Frédéric Claux, managing director for thermal & supply, EMEA, Engie, discusses prospects for the company in the green hydrogen space.

**E**NGIE SEES HUGE potential for hydrogen. “It is, of course, early days, but we see a number of opportunities here,” says Claux. “We have seen many announcements over the last 12 months, including in the Middle East.”

It is the multiple uses of hydrogen which makes it so promising, he says.

“Firstly, it’s the missing link with respect to renewables, to overcome the issue of intermittency. It can be used as feedstock in industries such as fertilisers, it can be used to decarbonise the so-called ‘hard to abate’ industries, and you can use it as a fuel as well in mobility, for example in shipping, trucks and buses.”

Engie has a number of projects ongoing around the world, mainly in Europe, and is working on a number of opportunities in the Middle East, where it has a strong base.

Claux sees the Middle East as a promising region given its competitive costs in terms of tariff per mw/hr, especially compared with Europe.

“Projects are still to be developed and structured, but there is huge potential,” he

says. “The challenge is to be more competitive, and the way to make it more competitive and affordable is to scale up. In order to do this, the equipment needs to be cheaper, and we need to find offtakers, since it’s a huge investment. The challenge is to find the offtakers willing to commit in the long term, on the assumption that prices are likely to go down in the coming years.

“Today green hydrogen is more expensive, but this is on the basis of smallscale projects,

“The challenge is to be more competitive, and the way to make it more competitive and affordable is to scale up.”

so the question is when is it going to become competitive compared with other forms. The general consensus is that green hydrogen will become competitive beyond 2030 or 2035,



Frédéric Claux, managing director for thermal & supply, EMEA, Engie.

but it might happen faster. Around 20 years ago we were in a similar situation with solar, and then the prices of solar panels came down, the performance of the panels increased significantly and we have seen a downward curve in the tariff. So maybe we can beat the consensus.”

## Battery storage

Another area in which Engie is very interested is battery storage.

“If you can combine renewables and storage, we can have a flexible supply of power with peak shaving,” says Claux.

“It can also be a flexible tool to manage the rest of the production sources. With the increasing penetration of renewables we will need more battery storage in the grid to adjust to security and flexibility objectives. Now it is quite expensive, but again, technology will change this, and we believe prices will go down as the need for storage increases and economies of scale are achieved. We are confident given the tremendous amount of research into this area that we will see an improvement in performance in the coming years, as we have seen with wind and solar.

“We launched a battery storage project in Australia a few months ago on a former coal plant site, South Africa’s Eskom is looking to tender a project and we expect some tenders in the region, particularly UAE and Saudi Arabia, given their big ambitions in renewables.” ■



Engie sees huge potential for hydrogen.

Image Credit: Adobe Stock

# From cable manufacturer to power solutions provider

Speaking to Technical Review Middle East, Ducab's Group CEO, Mohammad Almutawa, outlines the company's new strategy and how it ties in with the UAE's wider sustainability objectives.

Mohammad Almutawa, Group CEO, Ducab.

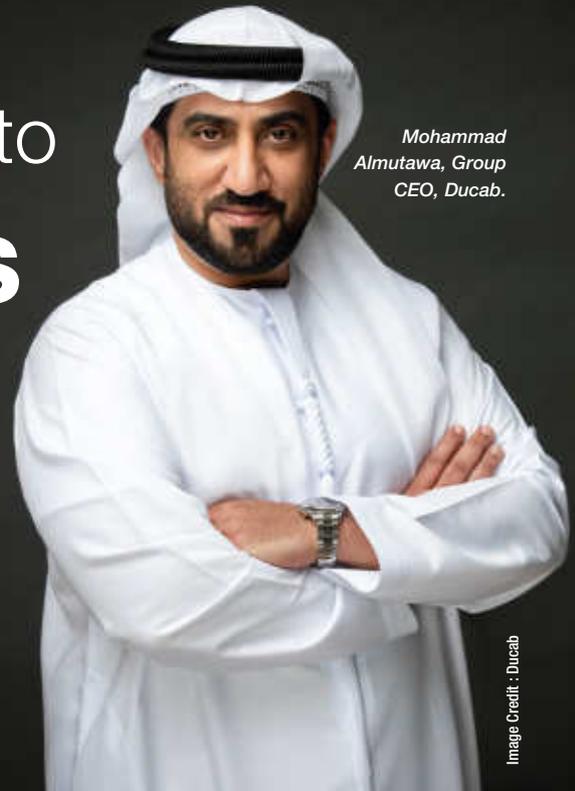


Image Credit : Ducab

IN OCTOBER 2021, Ducab, solutions provider to the global energy sector, launched its new corporate strategy and vision for providing 'Energy for Change'. The strategy sets a clear direction focusing on sustainable energy to drive further growth and international expansion, and is designed to generate positive economic, social, and environmental impact. This renewed purpose will mean providing innovative and sustainable energy solutions proudly developed in the UAE.

Mohammad Almutawa explains that the strategy is designed to ensure that Ducab remains competitive at a time when the world has changed and transformed following the pandemic. This has led Ducab, along with many other companies, to re-evaluate its business.

"Not only that, our sector has changed quite significantly. The market is saturated in terms of the number of contractors, and the UAE is an open and competitive market with no barriers to entry. This region is home to the biggest projects in the world, attracting global investors. So we have to operate at a different level from other manufacturers, contractors and suppliers.

"The new strategy is designed not only to ensure the future of Ducab, but also ties in with the future of the UAE," he adds.

"Ducab has always played a vital role in the UAE's industrial aspirations, and we always seek to lead the way for the sector in the UAE. That's why we've selected this time to introduce our new strategy. What we are looking to do is transition from cable

manufacturer to power solutions provider, thereby providing more value to our clients and customers, as well as to the UAE."

The new strategy focuses on two areas, Almutawa says. "The first is capitalising on the assets we have, trying to make them leaner, meaner and viable for the future. We have many internal initiatives for continuous improvement, for new technology and investment and systemisation, drawing on elements of Industry 4.0.

"The other area we're focusing on is growing in areas where we're not yet present, in terms of what we can offer the client. Providing a solution to the client rather than just supplying a product is the focal point of our new strategy."

**“Ducab has always played a vital role in the UAE's industrial aspirations.”**

Ducab's strategic realignment comes at a time when the entire world is focusing on mitigating climate change through decarbonisation, and the renewable energy sector is growing faster than ever. The UAE's Energy Strategy 2050 plans to increase the contribution of clean energy sources within the total capacity mix to 50% by 2050.

"Environment and sustainability are a big

concern for the UAE right now, and it is pursuing this on an international scale, with Expo 2020 being the biggest example. The push for sustainability, being environmentally friendly and social responsibility are important factors not only for the UAE but for Ducab specifically," comments Almutawa. He highlights a number of measures the company has introduced to reduce its carbon footprint, including the launch of a new solar park which contributes around 25% of the head office's power requirement.

"We have internal initiatives to increase the use of recyclable materials and processes to increase our recycling of polymer products and other elements," he adds. "We have updated some of our machinery to optimise power consumption and reduce our overall power requirement, as well as introducing a lot of automation."

Almutawa stresses that localisation is an important part of Ducab's contribution.

"Ducab has always contributed strongly to the local economy, with a focus on local procurement. We are the leader in local content, and that is reflected by being one of the most highly rated companies in terms of our ICV score."

Providing employment opportunities for the country's youth is also an important focus. The company's Emiratisation programme focuses on internships, training, and succession planning, and has led to the successful recruitment and retention of talented UAE nationals at every level across the organisation. ■

# The benefits of cogeneration

Cogeneration technologies can play an important role in combating climate change, by substantially increasing energy efficiency and independence, while reducing fuel consumption and the emission of greenhouse gases (GHGs).

**T**HE USE OF co-generation (combined heat and power, CHP) allows the simultaneous production of electrical and thermal energy through the same conversion process, using a single primary energy source. This increases the energy efficiency of conversion systems, realising a primary energy saving compared to traditional generation.

Leading genset provider Coelmo expands on some of the advantages:

“Cogeneration aims to increase the overall efficiency of a power generation system that produces electricity by allowing the recovery of the heat that would normally be lost in traditional power generation processes. The advantages of cogeneration systems are numerous. The main advantage consists in a reduction of overall cost of the cogenerated electricity and heat compared to the cost of purchasing the two energy vectors separately. The gain in efficiency of cogeneration systems also leads to a reduction of the overall gas emissions and a reduction of energy waste. Having a cogeneration system also reduces the reliance from the mains grid, which can be beneficial in those situations where mains power has continuous interruption of sudden voltage fluctuations.”

The company has wide experience in the design, supply, installation, commissioning and maintenance of cogeneration systems from 40 to 4000 kW and has supplied cogeneration systems to customers in sectors ranging from pharmaceuticals and healthcare to water treatment plants and biomethane production plants. Coelmo provides turnkey cogeneration solutions starting from the initial customer energy plant audit up to the cogeneration plant management service, with

“The advantages of cogeneration systems are numerous.”



Image Credit : Aramco

*Aramco operates a number of cogeneration systems on its projects.*

use of the most advanced remote monitoring and predictive maintenance tools.

Caterpillar, which offers a wide range of CHP generators ranging from 400 to 4,000 kW, comments, “Combined heat and power (CHP) can help to confront climate change challenges on both fronts: as an electric and thermal energy generation resource with lower greenhouse gas (GHG) emissions than other generation options, and as a resilient asset that can keep the lights on during grid outages. CHP can play a significant role in decarbonising the electricity, buildings, and industrial sectors. CHP systems require less fuel inputs for the same energy outputs, have a high capacity factor allowing them to displace high-emitting marginal grid resources, and can enable the addition of intermittent renewable resources to the grid by providing a consistent source of power.”

In the Middle East oil and gas sector, Saudi Aramco operates a number of cogeneration plants on its projects, and has done so for several years.

“Cogeneration systems are a major component of our strategy to be efficient in

our use of energy and achieve 100% self-sufficiency in electrical power generation for our operating plants,” says Aramco.

“Cogeneration enables us to produce electricity as a natural byproduct of our operations and reduces our energy consumption from the national utility grid.

“New operating facilities include grassroots cogeneration systems and we are retrofitting existing plants. We have added 1,318 megawatts of new power capacity at our facilities by completing a number of cogeneration projects, including the expansion of facilities at our Shaybah and Wasit plants.

“The adoption of cogeneration technology helps us promote energy efficiency, lower the energy intensity of our operating plants, add value to our hydrocarbon resources, and protect the environment.”

In 2021 Aramco retendered its planned independent steam and power producer (ISPP) project in Jafurah, with the contract expected to be awarded some time in 2022. The project will be developed under a public-private partnership (PPP) structure, with the

successful developer signing offtake agreements for power and steam production. It is planned to have a power generation capacity of 270-320MW.

For the low-pressure (LP) steam capacity, the project is planned to process a demand of 140,000 pounds an hour (klb/hr) by 2024 and 373 klb/hr by 2028. For the high pressure (HP) steam capacity, the target is for the scheme to process 112 klb/hr by 2024 and 321 klb/hr by 2028.

The Jafurah gas development is part of Aramco's US\$3.2bn unconventional resources programme, which aims to develop shale gas in three areas of the kingdom. The Jafurah unconventional gas field is the largest non-associated gas field in Saudi Arabia, the development of which will expand Aramco's integrated gas portfolio and help to make Saudi Arabia one of the world's largest natural gas producers. In line with the Vision 2030 masterplan, Riyadh is aiming to ensure the kingdom remains self-sufficient in gas supply as demand for power continues to grow in the residential and industrial sectors.

In October 2021 Abu Dhabi National Energy Company PJSC (TAQA) along with Marubeni Corporation announced a

partnership to develop the US\$1bn Tanajib cogeneration power and water desalination project with Saudi Aramco. The project is structured on a long-term 20-year build, own, operate and transfer (BOOT) basis with the electricity, desalination water and steam produced by the plant being a critical input for Aramco's strategic Marjan Project, which is central to Saudi Arabia's ambitions to develop its gas resources as part of the energy transition.

When constructed, the cogeneration plant and the seawater desalination plant will have a net capacity of approximately 940MW of electricity generation, a steam output of approximately 1,084 tons per hour, and a desalinated water output of approximately 19,470 cubic metres per day. The cogeneration plant consisting of gas turbines, heat recovery steam generators, and steam turbines can efficiently generate electricity with the waste heat used to generate process steam and achieve high thermal efficiency, which contributes to carbon emissions reduction by reducing natural gas consumption.

TAQA and Marubeni have signed a water and energy conversion agreement for a landmark greenfield industrial facility, as well as for the development of supporting

infrastructure including pipelines to connect the desalination and cogeneration plants to end users.

Commenting on the market for cogeneration in the Middle East, Coelmo says, "With the increased attention to environmental footprint, the use of renewable power sources, such as solar panels and wind turbines, is widely accepted in the Middle East. In Europe, together with the above mentioned renewable power sources, cogeneration is already a primer enabler to achieve carbon reduction targets. Most of the cogeneration systems from 40 to 4000 kW are fuelled by natural gas, which is a widely available resource in the Middle East. As of today, the usage of cogeneration in the Middle East is mostly concentrated for large power plants (>200MW), while the demand of cogeneration for the private sector is not yet mature.

"In order to boost the usage of cogeneration systems for private companies, there should be the introduction of governmental incentive schemes based on the reduction of gas emissions in the atmosphere, together with a significant investment in the natural gas distribution line to private users." ■



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# Unlocking the value in digital information

Bentley Systems discusses how to speed up the implementation of a digital twin with a trustworthy asset information system.

**A**SSET-INTENSIVE INDUSTRIES – such as process, utilities, and transportation – rely on accurate, comprehensive and up-to-date information for effective operations. Through maintenance, procurement, modifications and upgrades, however, asset information is always changing, and all these functions use the same information. Therefore, it is imperative to have consistent information across all consumers to ensure safe, reliable, and efficient operations. Often, though, the information is held in disparate and unconnected silos, with limited management of change across the digital ecosystem. The result is personnel spending more time trying to find the information that they need and verifying its validity and accuracy, leading to wrong decisions and increasing costs due to duplication or the wrong work being carried out. This situation ultimately puts the safety of the workers and the reputation of the organisation at serious risk.

What is required is a digital solution that connects these disparate sources together, validates the information, brings visibility to all changes across the asset lifecycle, and ensures reliability at the point of use.

Market-leading asset lifecycle information management software, such as Bentley's AssetWise ALIM, can help unlock the value in digital information from the day that it is deployed. Whether in the planning stage of a new project or operating an existing asset, it is important to have a flexible system that is easy to implement and ready for the first step toward asset management to save costs,

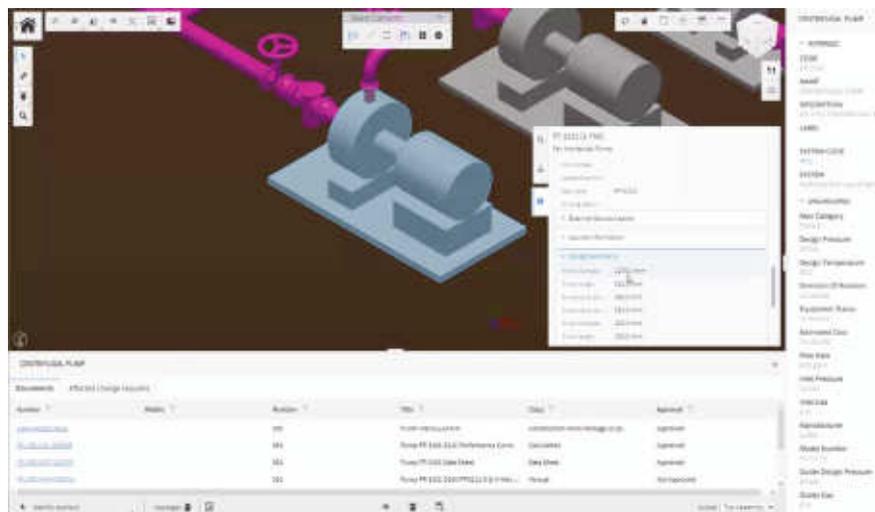


Image Credit : Bentley Systems

*View relevant and up-to-date asset information, such as the operational characteristics, related documentation, and affected change requests.*

improve safety and reduce risk. It can then be used as the backbone of a digital twin, effectively managing change and enabling easy access to validated and trusted asset data, documents and drawings in an open and connected digital environment.

## Deliver value from information faster than ever

One of the main challenges of implementing any new information management solution into a business or organisation is the time that it takes to get started and see value. It becomes more pronounced on larger projects that are more asset- and information-intensive. Getting started can take months, even years – time better spent delivering results. With an asset information system in place, it is possible to start small and see the benefits of asset lifecycle information from day one. From the time a system is deployed, there is access to an environment where teams can load documents and tag information, capture the full installation history of equipment, run simple review and approval workflows, distribute documents and search for the relevant information.

The sample configuration delivered with ALIM can easily be extended to support more complex business processes, such as managing concurrent changes or information packages.

The system allows asset owners to think big while proving small before scaling quickly across their asset base, creating an understanding of what to do and where to be upfront. They can start with a smaller project or asset to learn from, then roll out across the project or across similar operations. Like any leader in business, they want the shortest time to ROI in every project. Implementing a solution that is flexible means that they can start at any stage of digital maturity, use the information that they already own, and quickly see results to rapidly expand.

## Kick-start a digital twin solution

A digital twin is a virtual representation of real-world entities and processes, synchronised at a specified frequency and fidelity. Digital twin systems transform business by accelerating holistic understanding, supporting optimal decision-making and enabling effective action.

“With an asset information system in place, it is possible to start small and see the benefits from day one.”

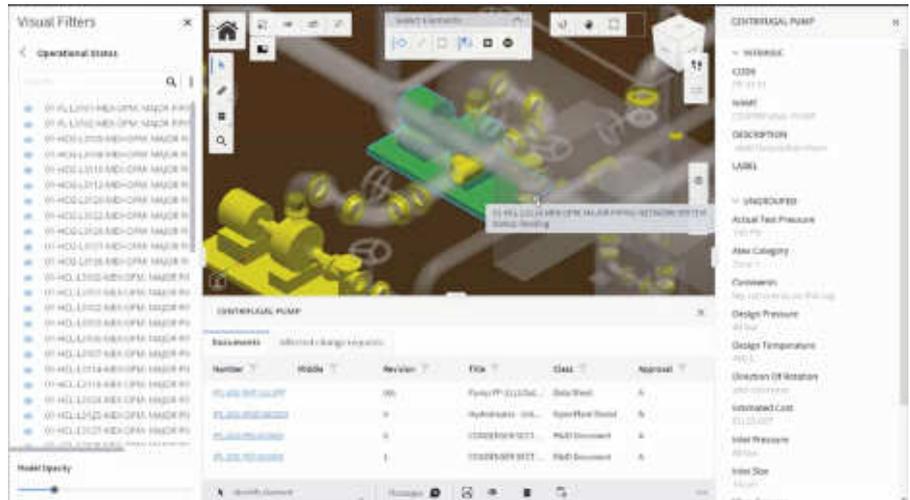
An ALIM system can be the foundation of a digital twin solution, ensuring that the digital twin is always consistent and up to date. Asset owners can take control of their lifecycle information quickly and easily by tailoring their solution with adding advanced tag management, document control, or developing robust change management workflows. They can work toward an immersive asset environment in which an object within a model can be clicked on to reveal its information, documentation, and change history.

ALIM operates in an open, interoperable, and connected environment, offering a set of cloud-provisioned services that provides support to digital workflows, context, and concepts, allowing firms to access accurate, reliable, and consistent information. A set of standard connectors to multiple third-party systems, such as SAP and Maximo, ensures that all users are accessing a common, validated, and up-to-date source.

**Remote familiarisation and control of work**

Safety requirements, workforce flexibility, remote sites and infrequent maintenance are driving the need for virtual, simultaneous familiarisation and control of work. Bentley's iTwin Visualization provides a facility to enable dedicated teams, workers, and contractors to prepare work safely and efficiently, while reducing the need for on-site visits.

This familiarisation is also critical for supporting daily operations and ensuring that processes are executed safely and on time. iTwin Visualization provides the context for managing work on site by displaying the operational status of the assets and ensuring a holistic view of the operational information that is needed to perform tasks. This capability is valuable when planning or working on a specific area of a facility, as it provides a quick visual assessment on a piece of equipment to see what changes may be pending, as well as the equipment detailed information.



View operational status of any asset within the digital twin.

**Generate sustainable benefits**

AssetWise ALIM has been successfully implemented over many years across a wide range of industries, delivering tremendous benefits and ROI.

An example is one of Australia's leading natural gas producers, based in Queensland, who has a master tag registry for its assets that includes more than 20mn data points. To handle a doubling of data from documents and model files, as well as migration of documents from systems based on energy performance certificates (EPCs), the company uses AssetWise ALIM software, hosted on Microsoft Azure. This application has reduced tag capture time by 90%, as well as lost time from maintenance

crews arriving on site without correct parts and tools.

**Support a digital twin**

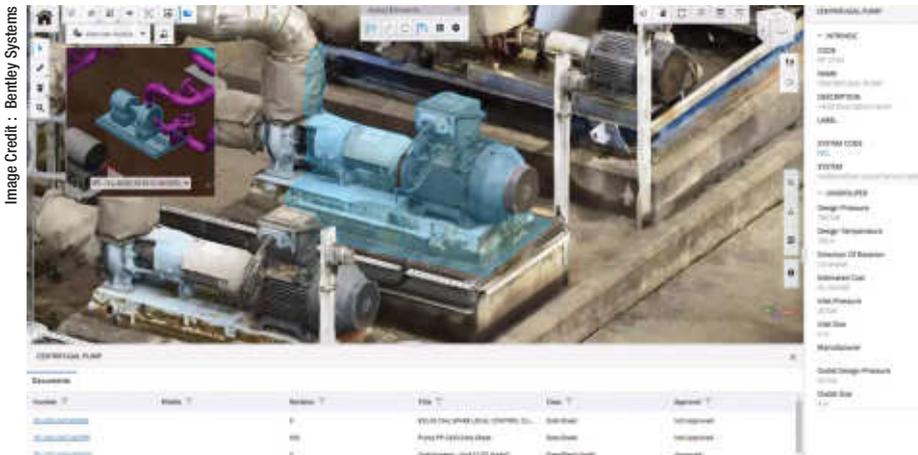
Used as the starting point of your digital solution, an asset information system is integral for keeping your digital twin evergreen through formal change management and workflow automation. AssetWise ALIM via an iTwin viewer enables access to an asset's operational information in the context of reality models, 3D models, and drawings. Users can search for assets based on specific criteria and then visualise them within the iTwin platform for further analysis.

The iTwin viewer simplifies daily operation and maintenance activities by providing quick access to relevant and up-to-date asset information, such as operational objects, related documentation, affected change requests, and projects. It provides complete visibility of the asset's status, including any planned changes. This visualisation aspect provides effective capabilities to navigate within the model, find information faster, highlight critical asset data and share information easily.

The flexibility and openness mean that you can work with the information you have from third-party software – by supporting interoperability, the data does not have to come from Bentley applications – as well as providing integration to other mission critical systems including SAP and Maximo. In the 2020 Verdantix survey, 69% of operations executives mentioned open architecture for integration as either a “very important” or an “important” criterion when evaluating software applications for asset management.

Bentley's AssetWise product line, including ALIM, works within your existing information ecosystem to drive actionable information from the data that you already own, making it the ideal entry point for your digital twin strategy. ■

“ An asset information system is integral for keeping your digital twin evergreen.”



The reality model of a facility provides a clear presentation of the actual site.

Image Credit : Bentley Systems

Image Credit : Bentley Systems

# Achieving net-zero goals with digitalisation

Digitalisation can help companies achieve both their sustainability and their business objectives, says Martin Piesker, head of digitalisation at Siemens Energy.

IT IS UNDENIABLE that sustainability and emissions reduction are at the top of the agenda now for oil and gas companies, many of which have set ambitious net zero targets. Digitalisation offers the potential to gain actionable insights into assets and processes, enabling better decision making for sustainable operations, as Piesker explains in conversation with *Oil Review Middle East*.

“Digitalisation is always based on data; looking at your data, finding the sweet spot in the data and what the operators and the equipment can tell us. Digitalisation is a way to look inside the asset, the process and ultimately the whole facility. It is not an end in itself; we are using it as a tool to get better insights. The real insights are the know-how you have about the asset, the process or the system itself.

“We need to use whatever the data tells us, beyond what we can see. For example, for determining the health status of assets, we analyse the data. We use AI and machine learning to give us first indications of what the data tells us, but the real strength we contribute as Siemens Energy, is what we know about the asset itself. So we’re not only looking at correlations, but adding our know-how from our experience in operating facilities and maintaining assets. What we look at is combining correlations and combining indicators. So this is what we do when we are using digitalisation; we are looking into the data and correlating the right data to give the right recommendations on what to do. That’s what we see as one of the main values of digitalisation for us.”

That doesn’t necessarily directly contribute to reducing CO<sub>2</sub> emissions, he concedes. “But the segway to it is, that by knowing the health status of your equipment, you can plan downtime and better plan production.

“It is becoming increasingly important in production not only to plan output, in terms of energy, barrels of oil or chemical product, but also to plan emissions, particularly in this region. We can use data not only to monitor emissions but also to predict them. Using data analytics and our know-how of the process, we are able to tell our customers the



Image Credit : Adobe Stock

*Digitalisation offers the potential to gain actionable insights into assets and processes, enabling better decision making for sustainable operations.*

amount of CO<sub>2</sub>, NOX or CO they will emit in the next week or month if they continue with the process they are using now. So we can have our customers balance their business targets and their environmental targets by looking at the data.”

Piesker highlights a particular use case relating to a customer in the Middle East, where Siemens Energy introduced a closed

“ We reduced emissions by more than 10% compared to the situation before.”

loop optimisation process of energy production within a gas turbine.

“The part that is most crucial for emissions, whether it’s CO<sub>2</sub> or NOX, is how the combustion works, how clean the combustion is,” Piesker explains. “So we monitor the combustion, we look at the

vibration, the flow of gas within the turbine, and at the same time we monitor the power output and the emissions.

“This is a very closed system; we’ve developed a unique patented system whereby an autonomous controller controls the combustion in such a way as to reduce emissions, without any human involvement, while at the same time keeping the business targets of our customers. So we are helping fulfil his power output targets while at the same time reducing emissions. The outcome was that we reduced emissions by more than 10% compared to the situation before.”

So impressed was the client with the results after a one-year trial, that they asked Siemens Energy to extend the optimisation beyond the gas turbine to the entire process. Siemens Energy has now deployed the same technology and approach on one of the customer’s plants, which has resulted in a huge reduction in gas consumption and a total efficiency increase of >1%, as well as a saving of >100,000 tonnes of CO<sub>2</sub> a year. Piesker points out that this has been accomplished without any hardware changes,

and minimal investment in technology, just by the application of an algorithm, and having it in closed-loop autonomous control.

This is a huge success story, he comments, and is particularly relevant for the region at a time when the UAE and Saudi Arabia have announced their net zero targets. “Technologies such as this, and innovations in decarbonisation, are helping our customers to achieve their net zero goals, and at the same time maintain their business targets,” says Piesker, adding that Siemens Energy has itself pledged to be net zero within its own operations by 2030.

### Embracing digitalisation with enthusiasm

Piesker comments that digitalisation is being embraced enthusiastically by customers in the Middle East.

“Our customers in the region have used the last one and a half years of the pandemic to educate themselves on the latest technologies, so we are now beyond the period of proof of concept and pilots. They know what they want and are very ambitious. The challenge and ambition for Siemens

“Here, we’ve found a good regulatory environment, and big customers with vision.”



Image Credit : Siemens Energy

**Martin Piesker, head of Digitalisation, Siemens Energy.**

Energy is to keep up with their requests. Here, we’ve found a good regulatory environment, and big customers with vision, who want to show they can be leading players in decarbonising their operations. Big players will take the first step without waiting for regulations to come out. In Europe and Asia, customers tend to be more cautious.

“Our customers see that being carbon neutral and having a decarbonisation roadmap can give them an edge in attracting new customers, suppliers or partners,” he adds, noting the diversification of petroleum companies into other forms of energy, as exemplified by the Qatar Petroleum’s rebranding as Qatar Energy.

In the future, the mid-term targets will have to be to bring the cost of decarbonisation initiatives down, Piesker continues.

“We’re demonstrating a project for the elimination of SF6 gases from gas-insulated switchgear. The technology is proven and there are customers who want it, but as long as there are limited incentives for reducing emissions and progressing green initiatives, they would be hesitant to invest in technology that is twice as expensive as conventional technology,” he says. “That is one of the big challenges for us, to bring the cost down for carbon neutral products. Digitalisation can play a role in sourcing, the optimisation of processes and the manufacturing, replacement and longevity of parts. If I only have to replace a part after 13 years instead of 10 years as I know its remaining useful lifetime, based on what the equipment tells me, this can lead to lower overall CO<sub>2</sub> footprint.”

Returning to the theme of the region’s leadership in digitalisation, Piesker concludes, “Our customers in the region want to stand out, be the first in everything. There are some that are seen as first movers, or lighthouses; then there are the early adopters. We have a few of these customers, or should I say partners, who are willing to try out new technologies with us, because they trust in us and what we develop. As far as digitalisation and these first-time applications are concerned, it has become more of a partnership than a supplier-customer relationship.” ■

## ABB survey highlights relationship between digitalisation and sustainability

ABB HAS RELEASED the findings of a new global study of international business and technology leaders on industrial transformation, looking at the intersection of digitalisation and sustainability.

The study, “Billions of better decisions: industrial transformation’s new imperative,” examines the current take-up of the Industrial Internet of Things (IIoT) and its potential for improving energy efficiency, lowering greenhouse gas emissions and driving change.

“Sustainability goals more and more are a crucial driver of business value and company reputation, and Industrial IIoT solutions are playing an increasingly important role in helping enterprises achieve safe, smart and sustainable operations,” said Peter Terviesch, president of ABB’s Process Automation business area. “Unlocking insights hidden in operational data holds the key to enabling literally billions of better decisions throughout industry and acting upon them, with significant gains in productivity, reduced energy consumption and lower environmental impact.”

The study, commissioned by ABB, found that an organisation’s “future

competitiveness” is the single greatest factor – cited by 46% of respondents – in industrial companies’ increased focus on sustainability. Yet while 96% of global decision-makers view digitalisation as “essential to sustainability,” only 35% of surveyed firms have implemented Industrial IIoT solutions at scale. This gap shows that while many of today’s industrial leaders recognise the important relationship between digitalisation and sustainability, the adoption of relevant digital solutions to enable better decisions and achieve sustainability goals needs to accelerate in sectors such as manufacturing, energy, buildings and transport.

#### Other findings include:

- 71% of respondents reported greater priority given to sustainability objectives as a result of the pandemic
- 72% said they are “somewhat” or “significantly” increasing spending on Industrial IIoT due to sustainability
- 94% of respondents agreed the Industrial IIoT “enables better decisions, improving overall sustainability”
- 57% of respondents indicated the

Industrial IIoT has had a “significant positive effect” on operational decision-making

- Perceived cybersecurity vulnerabilities are the #1 barrier to improving sustainability through the Industrial IIoT
- 63% of respondents strongly agreed that sustainability is good for their company’s bottom line, and 58% also strongly agreed it delivers immediate business value.

“The International Energy Agency estimates that industry accounts for more than 40% of global greenhouse gas emissions today,” said Terviesch. “If we are to reach climate objectives such as the UN’s Sustainable Development Goals and the Paris Agreement, industrial organisations need to implement digital solutions as part of their sustainability strategies. Embracing these technologies at all levels – from the boardroom to the facility floor – is key, as every member of the industrial workforce can become a better decision-maker when it comes to sustainability.”

For further information see <https://global.abb/topic/ability/en/better-decisions>

## CompAir launches new compressors in D-Series range

COMPAIR HAS ANNOUNCED its latest oil-free rotary screw compressors as part of its new D-Series range. The range covers air and water-cooled models from 37 to 75 kW and is available in both fixed and regulated speeds (RS) delivering ISO 8573-1:2010 Class 0 certified 100% oil-free air for the most critical applications.

For RS models, the combination of variable speed operation and hybrid permanent magnet (HPM) motor delivers ultra-efficient performance and lower energy costs. Offering best-in-class efficiency and 30% or more energy savings compared to conventional compressor control, the simple, virtually maintenance free HPM motor has 60% fewer components than a standard induction version. The motor also requires less power at start-up (95% efficiency at start-up) compared to other VSD compressors and never operates unloaded, thanks to an unlimited number of starts and stops.

Stainless steel components, dual-vented seals, and precision machined rotors with advanced Ultracoat prevent downstream contamination due to corrosion, while ensuring a trouble-free and long-lasting operation. The range also features a robust airend with precision machined gears, oversized bearings, stainless steel air seals, and unique labyrinth oil seal design to eliminate the risk of internal leaks. Meanwhile, an intuitive Xe system controller with integrated speed control, remote communications capability, and extensive events history, enables users and owners to optimise and improve compressor performance. The compressors are able to withstand the harshest environments and 46°C maximum ambient temperature. They feature iConn, a smart real-time online monitoring service, as standard.

David Bruchof, oil-free product manager, said, "Capable of delivering pressure ranges from 7 to 10 bar and volume flow between 3 to 13 m<sup>3</sup>/min, CompAir's new D-Series oil-free solutions can be relied on to provide consistent, cost-effective and virtually maintenance-free high-quality compressed air. D-Series range compressors are also offered with an extensive range of options to suit a user's unique requirements. For



Image source: CompAir

The CompAir D37 compressor.

example, our Energy Recovery System (ERS Ready) sees compressor operating heat, usually lost to the atmosphere, recovered and repurposed for applications such as hot water, heating, and industrial processes. This not only leads to huge savings but plays an important role in contributing towards sustainability goals and green credentials."

For more information, please visit: <https://www.compair.com/en-gb/two-stage-oil-free-screw-compressors>

### Compressor optimisation to meet new process requirements

A LEADING EUROPEAN oil and gas company, focused on exploration and production in the Mediterranean, needed to modify the capacity of a compressor to meet new process specifications requiring a more than 50% reduction in gas flow, from 5,000 Nm<sup>3</sup>/h down to approximately 2,000 Nm<sup>3</sup>/h. The gas composition was challenging, being a H<sub>2</sub>S + hydrocarbon mix.

The customer contacted Burckhardt Compression to revamp and overhaul the compressor to efficiently meet the new operating parameters. A detailed inspection and engineering study were carried out to identify the optimal approach to modification and revamp.

The solution involved the delivery of new cylinders with smaller diameters, achieving the new flow rate. The new cylinders were implemented without requiring any modifications to the existing foundation, gas and cooling water piping or the electrical motor.

All internal cylinder parts were manufactured in-house according to API standards, and a complete overhaul of the compressor was carried out at a Burckhardt Compression Service Center, including repair of the crank case, distance piece and crankshaft.

The customer benefited from energy savings of around 1,800 MWh per year by adapting the compressor to the lower flow requirements and therefore avoiding the bypass system.

You can read the whole case study at <https://www.burckhardtcompression.com/compressor-optimization-meets-new-process-requirements>

### The benefits of Integrated Compressor Control

DO YOU OPERATE two or more compressors? Does your plant have varying system demands? Are you required to meet specific system demands while maintaining maximum efficiency?



Image credit: FS Elliott

Compressors are connected through an integrated P2P network.

If you answered yes to any of these questions, then Integrated Compressor Control (ICC) could be right for your application. Integrated Compressor Control (ICC) is a feature that allows for sequencing multiple compressors to maintain a constant system pressure while ensuring maximum energy efficiency and minimal blow-off.

When using the ICC feature, compressors are connected through an integrated Peer-to-Peer (P2P) network. The P2P network, coupled with the ICC sequencing software included in each of the local control panels, allows users to select any of the networked compressors as the master controller, thus creating redundancy and reducing cost by eliminating the need for a separate master controller.

In a blog entitled 'Controlling a multiple compressor installation using integrated compressor control', FS Elliott discusses how ICC works and the benefits it provides.

See <https://www.fs-elliott.com/Blog-Item-Controlling-a-Multiple-Compressor-Installation-Using-Integrated-Compressor-Control>

# Detecting clogs in subsea pipelines

Studies conducted at the Technical University of Munich (TUM) have found a new neutron-based method to detect clogs in subsea pipelines.

INDUSTRY AND PRIVATE consumers alike depend on oil and gas pipelines that stretch thousands of kilometres underwater, transporting the sources of energy to storage and production facilities on land.

It is not uncommon for these pipelines to become clogged with deposits. Under certain conditions, the mixture in the pipelines – which typically comprises gas, oil, and water – can become very viscous and even form solid phases.

Especially inconvenient for operators are solid hydrates that form from gas and water, for example when the mixture cools down to the low temperatures of the seabed during longer pipeline shutdowns.

Until now, there have been few means of identifying the formation of plugs in-situ and non-destructively. Studies at the Research Neutron Source Heinz Maier-Leibnitz (FRM II) at the Technical University of Munich (TUM) now show that neutrons may provide a solution.

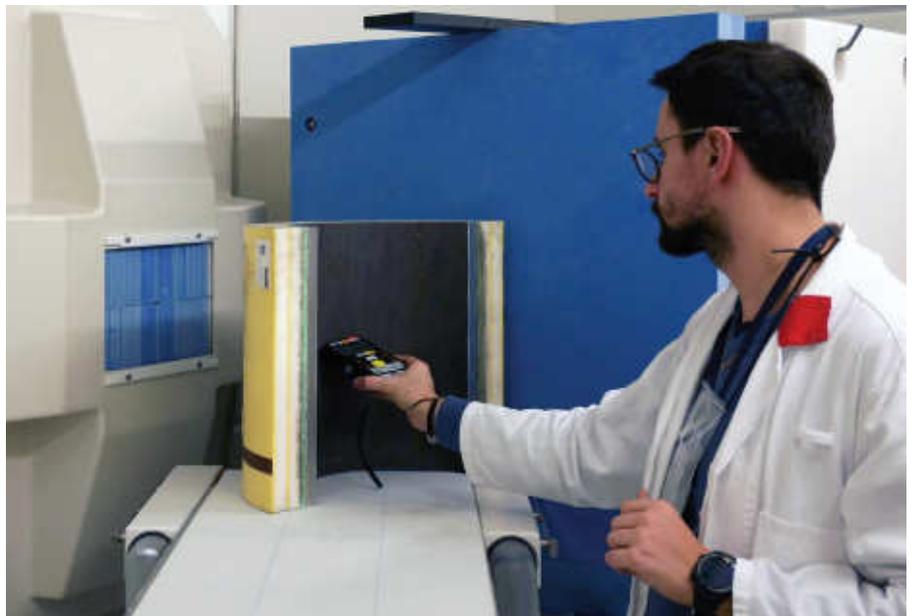
For a clog to be remediated in-situ, the affected section of the pipeline must first be found. Localising clogs from the outside is challenging, since they can form anywhere along the length of the pipeline.

To date, thermal imaging cameras and gamma rays are used to detect the clogs. However, neither of these methods works underwater. Ultrasound, on the other hand, has no problem penetrating water, but the hydrate blocks can only be detected at close range from outside the pipeline wall.

This constraint poses practical difficulties because underwater pipelines are laid at depths of up to 2,000 metres and are often naturally covered by seabed materials like sand or silt. Another technical challenge associated with acoustic methods arises from the lack of a clear difference between the acoustic impedances of the hydrate phase and other phases of the crude oil mixture, which makes discrimination difficult.

## Neutrons – the perfect probe

TechnipFMC was "looking for a more efficient method to find the plugs in a non-contact, non-destructive and reliable way despite thick walls," said Dr. Xavier Sebastian, a project



*Adjusting a pipe segment for a neutron experiments.*

manager at the company.

Dr. Sophie Bouat, CEO of Science, SAVED (Scientific Analysis Vitalises Enterprise Development), suggested that neutrons are the perfect probe for the task at hand. She established the contact to the scientists at the Heinz Maier-Leibnitz Zentrum in Garching near Munich.

"Using prompt gamma neutron activation analysis, light atoms and hydrogen in particular can be detected very precisely," she said. Since the hydrogen content of hydrates and normal oil or gas is considerably different, it should be possible to detect blockages by measuring the hydrogen concentration.

Dr. Ralph Gilles, industry coordinator at the Research Neutron Source FRM II, carried out a feasibility study on this topic together with other colleagues from the Technical University of Munich and the Forschungszentrum Jülich. Using the PGAA (Prompt Gamma Activation Analysis) instrument, which utilises cold neutrons from FRM II, the researchers established that this approach can be used to differentiate between oil and gas and the blockage.

At the NECTAR radiography and tomography facility they used fast neutrons from FRM II to show that a sufficiently large number of neutrons penetrate the metal walls of the pipelines to facilitate the respective measurement, and that the measurement also works well underwater.

The results clearly demonstrate that neutrons are ideally suited for this application. "Our experiments have shown that we can even distinguish an incipient blockage from a fully developed one," said Dr. Gilles. "That's very beneficial, because then one can even preventatively heat a pipe segment to melt the blockage before it fully develops."

In practice, a mobile detector with a small neutron source will move back and forth along the pipeline to look for plugs.

"We are very pleased that, with the help of the measurements at the Research Neutron Source, we have now found an efficient method that makes it much easier to detect these plugs in the future," said Technip's Dr. Sebastian. ■

Image Credit : Dr. Sophie Bouat / Science-S.A.V.E.D. / TUM.

*Pipelines can be difficult to monitor given they cover long distances, often in remote terrain.*

Image Credit : Adobe Stock

# Rapid response pipeline protection

Integrating DAS and UAV technology offers a good solution to protect pipelines, says Pedro Barbosa, industry sector manager – Pipeline at Fotech, a bp Launchpad company.

**W**HEN CRIMINALS HOT-TAP pipelines in an attempt to steal product, quick detection and a rapid response are needed to avoid leakage and costly clean-up. Distributed Acoustic Sensing (DAS) technology is a proven technology currently deployed on thousands of kilometres of pipelines worldwide, which can detect a threat and raise an alarm within seconds. But even when an alarm is raised, long distances and challenging terrain mean that it can take a security team a long time to arrive at the site and intervene.

The rapid advancement of Unmanned Aerial Vehicles (UAV), or drone technology, introduces new possibilities, including the automatic threat-response launch and flight of a UAV to coordinates provided by DAS. With the right strategy, a UAV can reach a location along a pipeline in the required target response time, providing footage from visual

and thermal cameras.

Movement of vehicles or of people walking near a pipeline, the activities of digging in the ground by hand or machine and the fitting of a hot-tap all generate noise as well as vibration in the ground. If a fibre optic cable is buried in the ground near the pipeline, a DAS system can monitor and detect events that are of concern and raise an alarm. The algorithms are also smart enough to ignore activities that are of no concern, reducing false alarms. DAS technology can alert a pipeline operator to a threat within a few seconds, but the challenge is how to respond. By their nature, pipelines cover long distances, often in unpopulated and inhospitable terrain. UAVs can provide a fast response, to fly a direct route from base to the threat location, capture visual and thermal images of activity and let the criminals know that they have been detected.

## Acceleration of UAV technology

Mobile device technology has driven vast improvements in battery capacity, and UAVs now feature small, lightweight electric motors and petrol engines, or even a hydrogen fuel cell, enabling longer flight times. UAV construction materials have also been rapidly evolving. 3D printing and design have enabled the creation of light airframes and components, which helps reduce fuel consumption. Developments in mobile camera technology mean that UAVs can now carry sophisticated cameras – providing high-resolution images and video from a lightweight device carried below the airframe. Advancements in machine learning, computer vision and onboard image processing enable UAVs to detect any element of deviation from a given situation, such as the presence of people or vehicles. This ability can be extended to a wide range of other payloads and sensors, such as OGI (Optical Gas Inspection) cameras, thermal and infrared sensors, magnetometers and radars, as well as in scenarios where UAVs play a proactive dissuasion and inspection role.

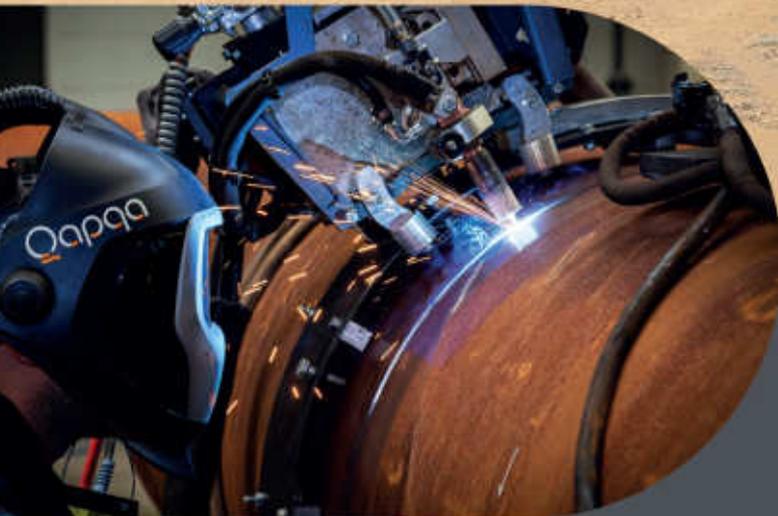
## Ground control to UAV – two-way communication

There are two aspects to communication with a UAV. First is the ability to control the UAV and to fly it safely to its destination. Second is the provision of a data feed from a visual or thermal camera or other sensor so that a threat can be assessed. These

“ The rapid advancement of UAV, or drone, technology introduces new possibilities.”



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communications have improved significantly, and it is now possible for a UAV to fly on autopilot and be monitored by an operator in a control room on the other side of the world. The autopilot will typically be able to mitigate any loss of communications and respond with the appropriate safety procedure. UAVs can also carry a microphone and loudspeaker from which a security officer can communicate with criminals. The latest DAS systems, such as Fotech's LivePIPE II, can be easily set up to operate with UAVs. DAS notifies the UAV flight management system where the threat has been detected by providing GPS coordinates. The flight management system automatically determines the flight path, taking into consideration the topology and obstacles, the endurance of the battery and the weather conditions. The UAV takes off autonomously and flies to the designated coordinates, with the flight

“ A DAS monitoring system with integrated UAV technology creates a powerful detection and response system.”



*Drones can play an important role in pipeline inspection and protection.*

Image Credit : Adobe Stock

monitored from an operations room either at the pipeline operator's security centre, or at the UAV service provider.

### Optimising logistics and minimising leak detection costs

It may not be practical to shut down a pipeline immediately based only on an alarm from the DAS system. A UAV can provide video of the ground conditions, looking for signs of a leak, for example. In the future, a UAV may even be able to carry some form of spill kit, such as an absorbent, which could help contain the extent of a spill. A UAV could also be used to support a response team after they arrive on location. For example, if the team is trying to urgently stop a flowing leak and needs a part, or tool from base, it

could be rapidly dispatched by the UAV. UAV flight is low-cost, and operators can establish a programme of missions, additional to those prompted by a DAS alarm. These could be to carry out inspection of the pipeline or simply to act as a deterrent to prevent criminal activity in the first place.

A DAS monitoring system with integrated UAV technology creates a powerful detection and response system capable of preventing illegal hot-tapping of pipelines as well as responding quickly to leaks, preventing environmental disasters. With the right strategy, a UAV can reach a location along a pipeline in the required target response time. Even at night, a UAV can make its presence known to criminals with high-powered LED lights and audio, preventing a tap attempt. ■

## Forth devises system to retrieve cleaning devices stuck in pipelines

A TEAM OF engineering experts at UK-based Forth has developed a remotely operated mechanical retrieval system to remove cleaning devices, known in the industry as Pigs, which have become stuck in oil and gas pipelines.

Pigging is a standard process within the oil and gas industry where the device is sent down a pipeline using the downstream pressure, which then drives the item to the end of the line to allow plant production to continue.

The engineers designed and manufactured a spherical pig retrieval system, which could quickly remove the stuck devices and would enable recommissioning of the process line without taking destructive measures.

The system comprises a lightweight and modular design complete with a suction cup grab system with auto release to connect with the Pig. It is fitted with electrically conductive castors to protect the system from explosive atmospheres, and comes with a spring loaded trolley and castor assemblies, to mitigate



*The spherical pig retrieval system.*

Image Credit : Forth

circumferential imperfections and defects in the pipeline.

A front mounted ATEX Zone 1 camera is fitted to the system and relays live images back to an accompanied ATEX zone rated tablet device handled by an operator.

Rob Sneesby, senior mechanical engineer, said, "Our customer was clearly frustrated with being unable to retrieve the Pigs. Time was certainly against us as we were asked to conceptualise, design, build and manufacture a system which would remove the Pigs with ease, all within an eight-week period. We are extremely proud to say that we met this challenge well within the timeframe and within budget.

"This system proved how effective it is in removing the Pigs and how it could help operations across the oil and gas industry by improving productivity and therefore saving a substantial amount of money."

The team at Forth has also recently devised a system to remove non-spherical Pigs from industry pipelines.

# Corrosion prevention in pipelines

A GPT Industries webinar discussed the weak links in monolithic isolation joints (MIJs), and how the company has addressed them.

**M**ATERIAL, WELD AND equipment failures along with internal and external corrosion around pipe connections are a major cause of pipeline failure.

In a webinar entitled 'Pipeline corrosion prevention: eliminating the weak link', Alex Grimmer, product manager at GPT Industries, discussed the role of monolithic isolation joints (MIJs) and their role in corrosion prevention, explaining how GPT has improved the design of MIJs, as well as the manufacturing and testing processes, to ensure joint integrity and performance. The company's ElectroStop MIJ is specially engineered to eliminate dangerous leaks and corrosion and permanently seal pipeline connections.

Grimmer explained that a Chevron paper issued in 2014 had highlighted weak points in MIJs and the manufacturing process. These include the risk of chemical attack on nitrile seals, hard weld heat affected zones, issues with forging and pipe traceability, weaknesses in the isolation material, common design issues, and permeability and temperature thresholds.

"We went through these findings systematically, improving MIJ design and material section, material traceability, test integrity and inspection processes, to ensure that every MIJ that leaves our facility is made properly to isolate and withstand the conditions of the pipeline it's going to be welded into," said Grimmer.

GPT upgraded the o-rings to a viton material which can withstand a higher temperature threshold as well as offering exceptional chemical compatibility. Grimmer noted the high temperatures the joint can be exposed to both during the manufacturing process and during its life in the pipeline, which had been highlighted in the Chevron paper and had caused competitor products to become damaged and unsealed.

"While we can control the temperature in the manufacturing process, there can be unexpected temperature surges, so it is important to have safety factors in those

materials and their capabilities to cope with the production process and applications post-installation," he commented. "The design life expectations for MIJs can be 20-30 years or longer; the joint is going to be welded into a pipeline system, buried and forgotten – so it's important to plan for the worst case scenario."

With regard to the isolating material, Grimmer noted the importance of controlling the weld heat during the manufacturing process. One of the flaws of GRE materials is that they can be permeable, so the company is working with GRE sheet producers to eliminate this as far as possible.

Grimmer stressed the importance of testing every MIJ individually from start to finish to ensure integrity. "With an MIJ there are so many variables that can occur during the production process; it doesn't mean every joint is created equal. So every single part has to be tested to make sure it properly isolates and properly seals, and can withstand pipeline conditions," he said. "We'll hydrostatically and pneumatically test every joint that's produced in our facility." He added that controlling temperature during welding is essential for successful MIJ production, and that every weld has to be inspected.

“With an MIJ, there are so many variables that can occur during the production process.”

Grimmer discussed the role of coatings, both internal and external, in improving the integrity of the MIJ and adding durability and longevity to the joint. The proper selection of the internal coating is critical to avoid comprising the ability to isolate the electrical current and prevent damage to the internal components. If the pipeline is running above ground, a topcoat should be added, polyurethane being ideal for long-term durability.

He stressed that coatings were only as good as their application. "The simplest failure at the surface preparation step can lead to coating disbondment or failure to adhere to the substrate."

Grimmer highlighted the importance of material and product traceability and providing test records, which the Chevron paper had highlighted as a common pitfall for manufacturers.

"Lack of traceability in steel components is a major risk...if you don't have any test reports or material traceability, that part is basically worthless. It can't go into the pipeline with confidence. Traceability and test reports ensure not only that the joint is made properly, but that you can prove that with the paperwork." Essential traceability reports are Steel MTR, hydrotest reports, coating inspection reports and weld inspection reports.

Finally, Grimmer said that while the ElectroStop MIJ, which has been designed and built in the USA for many years, has been very successful, it has faced shipping and production cost challenges in these uncertain times. The company has therefore partnered to make a more accessible MIJ in terms of price and leadtime, based on the same quality system that it has been developing over the last seven to eight years. Available to customers across the globe, the ElectroSeal is based on the proven u-seal design and two-part epoxy system, and is available in a full range of pressure classes, with material traceability and all relevant test reports.

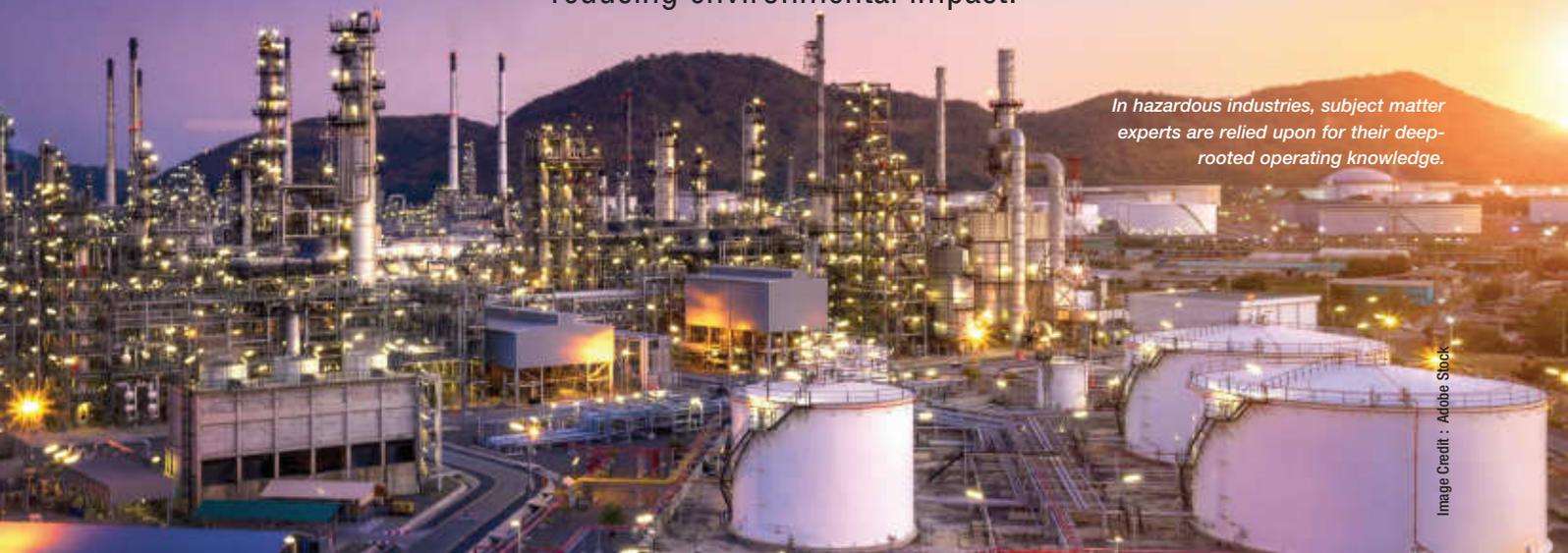
"We've been working to bring this product to market for the last couple of years, and are starting to see acceptance grow. We're going to work to grow awareness of this product, and continue to try to add value for you and your partners," Grimmer concluded.

The presentation was followed by a lively q&a session, when Grimmer was joined by Rony Roy, senior applications engineer at GPT Industries. ■

For further information see the website at [www.gptindustries.com](http://www.gptindustries.com)

# Closing the operator knowledge gap in the Middle East

Global tech company Voovio discusses the benefits of 'Knowledge Automation', in building operator competency faster, increasing safety and profitability, and reducing environmental impact.



*In hazardous industries, subject matter experts are relied upon for their deep-rooted operating knowledge.*

Image Credit : Adobe Stock

## The Tribal Knowledge challenge

In hazardous industries such as oil, chemical, refining and manufacturing, there are selected operators usually known as subject matter experts (SME) that are called upon for their deep-rooted operating knowledge. It is these individuals you count on when an unplanned event occurs. They put in practice their dexterity in order to make the operation safe and to mitigate any unforeseen events from happening during an unplanned shutdown, to actively participate in a critical equipment overhaul and or swap out, to respond to a major event or turnaround or to promptly address an EHS incident to minimise impact. Their knowledge, labelled in the industry as 'Tribal Knowledge', is only apparent when watching these veteran operators execute plant operations. Tribal knowledge, while largely a benefit to process units in a pinch, is a trap for operators and their organisations because it is person-dependent, not documented and reviewed in a system, and has not been vetted through the site's rigorous management of change (MOC) process.

Embracing and recognising these experts that have a wealth of undocumented tribal

knowledge for their ability to 'save the process' might become risky for the unit, site and company leadership. Promoting this behaviour instills a focus on results that is not sustainable and lacks operational discipline. Exacerbating the issue, the 'experts' end up training less experienced operators on how to operate the plant 'more efficiently and/or effectively' by not entirely following the operating procedures. As time passes and the experts retire, the less experienced operator relies on his/her passed-down knowledge to safely operate the plant, instead of documented procedures. When an organisation openly or subtly promotes knowledge as paramount, procedures become secondary, and a sense of 'knowing how' sets in and execution details are missed. A knowledgeable operator may not necessarily be a competent operator.

After collecting and analysing data from projects implemented across the industry, it is apparent that operating practice/knowledge is not aligned with operating procedures when walking procedures with SMEs in the plant. This is a process safety issue, and it is well documented that any organisation lacking operating procedure discipline will, inevitably,

experience unplanned incidents and events.

## The 'added' challenges

Recognising experts with 'Tribal Knowledge' is one risk, but the list of added challenges facing the industry in the Middle East continues to grow, including:

**Mass retirements:** A record number of staff are retiring, constituting a "Great Crew Change". This causes a loss of organisational knowledge which cannot be quickly or easily restored.

**Overstretched subject matter experts (SMEs):** SMEs are already pulled in many directions internally, with procedures often affected by SMEs needing to support onboarding or refresher training for less experienced personnel.

**Slow and inefficient onboarding:** Many plants face difficulties to digitalise the onboarding process for newer operators, struggling to adopt new technologies which can decrease the "ramp time" for new joiners.

**Lack of qualified talent:** Finding qualified talent in a region where unemployment is only 11.6% is challenging, albeit entry level or with some level of experience.

These might be some of the top of mind

challenges, but the results of not being able to address these issues are even more concerning, including increased downtime and an uptake in incidents, with an impact on productivity resulting in decreased quality, margins and revenues.

## Bridging the gap with Knowledge Automation

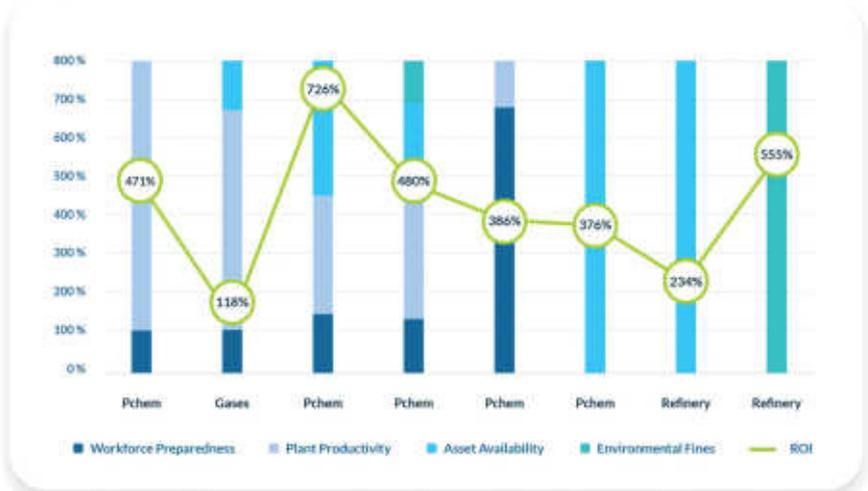
In an industry where so many of the key challenges are linked to human factors, having the ability to understand how technology can help to retain knowledge and deliver the onboarding of new operators more efficiently, is key to bridging the knowledge gap. At Voovio, we've worked with a wide range of industry leaders (including Sabic, Total, BASF, Halliburton and Dupont) on this challenge – using Digital Replicas, Procedure Simulators and Field Execution Tools. Combining these solutions, leaders in operations, maintenance and L&D are able to achieve “Knowledge Automation”, building operator competency faster, increasing safety and profitability, and reducing environmental impact.

## How does a Knowledge Automation platform work?

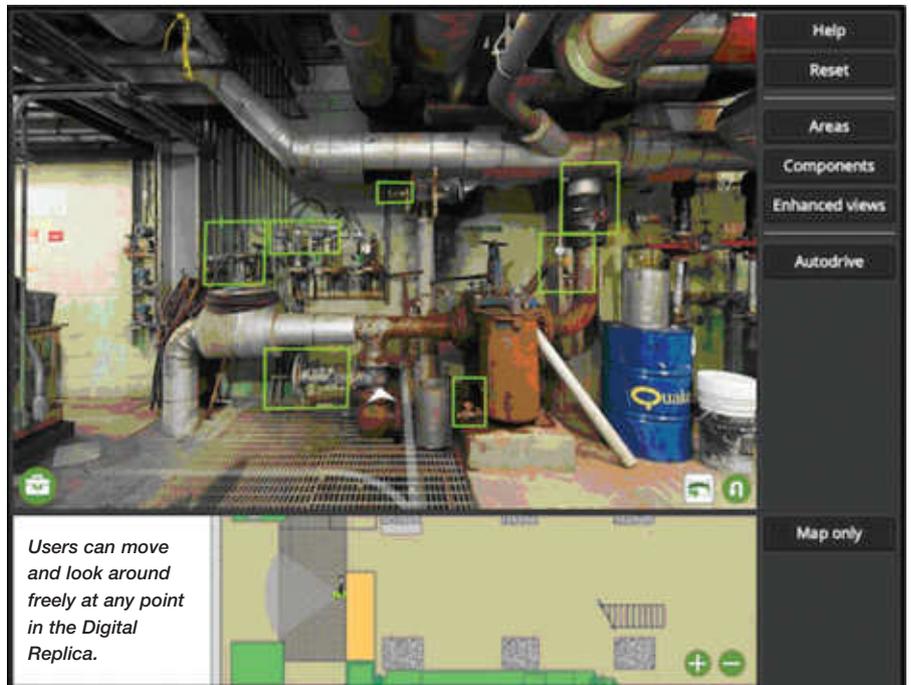
**Digital Replicas** - A Digital Replica is a real-life representation of the process environment. A photographic simulator technology with continuous navigation capability and interactivity, made up of 2D photographs (making updates sustainable and feasible). Users can move and look around freely at any point in the Digital Replica, making it feel as though they are actually walking within the plant. A detailed map shows users where their current location is, allowing users to select new locations immediately and easily. Components are tagged, indexed, searchable and readily accessible.

**Procedure Simulators** - Simulators enable employees to learn, practice and review procedures with high levels of realism, immersion and interactivity. Each Procedure Simulator includes four modules to cover training and assessment end to end. This includes guided (procedures with step-by-step assistance), learn (similar to guided but with less assistance and ability to walk manually), refresh (similar to guided with faster reviewing capability) and test (where users can test on a section of or the entire procedure, ahead of performance evaluation).

**Field Execution Tools** - The Field Execution Tool (FET) is an operations assistant designed for mobile device screens and is included for each procedure, in addition to four simulator modules. The Field Module assists users in the field while executing critical procedures. Users are able to check each step of their procedures, view the guided module of each step in a new browser tab, take notes, view progress, and change operators at any time. A report is generated, detailing when each step was completed, by whom and notes.



The results of investments in Voovio technologies for a range of Middle East petrochemical plants and refineries.



## Measuring results

Of course, leaders need to be able to measure the results of their investments in technologies such as these – which is something we have focused on in four areas here at Voovio: workforce preparedness, plant productivity, asset availability and environmental fines. At the top of the page you can see the final summary of this for a range of petrochemical plants and refineries in the Middle East.

To give a specific example, a refinery adopted Voovio to try and eliminate loss of containment of process materials (resulting in reportable incidents and regulatory fines). They used our platform for a line walk process to create an action checklist clearly defining all release sources, practice procedure simulators prior to procedure execution and

our field execution tool. In this particular case, the main ROI contributor has been the elimination of environmental releases (totalling US\$1mn in avoided fines).

## Getting started with Knowledge Automation

If you're looking to find out more about how to start your plant's journey in Knowledge Automation, we'll be delivering a webinar entitled 'The Operator Knowledge Gap: 5 Ways Top Plants Are Preparing' where we'll explore a wider range of examples with real-life demos, discussing the specific challenges and business results achieved. Find out more at: ■

<https://www.alaincharlestraining.com/webinar/voovio-technologies>

# Managing latency and congestion for improved performance

Charbel Khneisser, regional director – technical sales, META at Riverbed, outlines how oil and gas companies can overcome the negative impact of latency and congestion.



*Remote workforces have exacerbated latency, congestion and bandwidth issues.*

Image Credit : Adobe Stock

**T**O SUPPORT THE remote locations of exploration sites and rigs, oil and gas companies have vast Internet networks. The isolated nature of these sites often means that normal Internet connections are impossible. As a consequence, oil and gas companies are often heavily reliant on VSAT (satellite) links that are often plagued with very high delay and limited ability to expand the volume of information that can be shared over the connection. The result? Oil and gas companies frequently suffer from disconnects and performance challenges that cause frustration for employees and project managers. This, in turn, can mean drilling production is slowed, which leads to costly penalty payments. Furthermore, these issues are now being exacerbated by additional congestion on networks caused by employees 'working-from-anywhere' and shifting to Software-as-a-Service (SaaS) applications. This can further result in slowed production time and possible financial damage.

It is therefore paramount for oil and gas companies to take control of managing latency and congestion in order to maximise performance for their business. But how do oil

and gas companies go about this? The answer lies in end-to-end visibility, performance measurement, and the acceleration of applications.

## The test of remote working

In March 2020, oil and gas companies, along with the rest of the world, were forced to completely change the way they operated and communicated. They not only faced some employees operating on rigs or sites in extremely remote locations but also entire workforces working from home, on multiple devices. Systems had to be rapidly implemented to enable communication across all of these varied locations. Companies were forced to quickly embrace collaboration technology to ensure entire remote workforces remained connected.

“ Oil and gas companies faced frequent network disconnections and outages.”

To overcome the disruptions brought on from having to work remotely from home, oil and gas companies aggressively turned to SaaS applications such as Microsoft 365 and moved to more cloud-based systems. In fact, SaaS technology is expected to account for more than 50% of global cloud services revenue in the energy sector by 2024. As employees were unable to travel to and from rigs and exploration site locations, these solutions became essential for communication and business continuity. Armed with SaaS solutions, dispersed workforces could effectively communicate, keep production lines flowing and remain in contact with co-workers as they adapted to virtual interactions.

However, the fully remote workforce exacerbated the latency, congestion and bandwidth issues oil and gas companies were already facing. Massive strain was being placed on network links as an increased number of employees operated on them, using bandwidth-heavy SaaS applications. As a result, oil and gas companies faced frequent network disconnections and outages, leaving users frustrated and the wider business facing detrimental financial damage. For example, one day of downtime caused by unreliable

connectivity can cost up to US\$1mn a day in rig rental costs.

All this presented major challenges for oil and gas IT teams. They had to manage a huge wave of applications and devices that were now on the network – all with a complete lack of sight over who and what was happening at any moment, and were left to rely on users flagging issues. To help resolve these issues and manage latency and congestion, many Riverbed customers turned to performance management tools and SaaS acceleration solutions.

### Visibility and optimisation in energy

The starting point for improving bandwidth and latency is to invest in network performance management solutions. Riverbed works with customers to collect and analyse data coming in from every application, across every device in use. Equipped with the resulting insights, IT teams can identify any problems that are occurring and implement application performance actions to rectify them. This in turn means that downtime can be reduced and productivity can be

“Implementing the right SaaS solutions isn’t enough.”

maximised for the benefit of both users and the business as a whole.

One large oil company opted to deploy SaaS accelerator tools to maintain efficient lines of communications between rigs, offshore platforms and land-based offices. The organisation implemented Microsoft 365, but due to the remote business outposts, connections were delayed and performance issues hampered employee productivity. By introducing a SaaS acceleration solution from Riverbed, the customer was able to achieve data reduction of up to 60%, resulting in Microsoft 365 operating much quicker as the data took up less capacity. Not to mention troubleshooting network inhibitors such as high latency and congestion. This had two-fold benefits. It ensured issues could be quickly found and resolved so employees

could operate efficiently, increase production, and achieve bonuses. In addition, by providing connectivity for entertainment such as TV and films as well as calls to families, employee morale was maintained.

### Putting latency and congestion issues in the past

As evidenced from the last 18 months, having the right technology in place to support employees in even the most remote locations is critical to the success of oil and gas companies. However, implementing the right SaaS applications isn't enough – these applications need to work effectively. By adopting solutions that enhance network visibility and maximise application performance, companies can successfully manage and overcome the negative impact of latency and congestion. As a result, they can operate with the assurance that employee productivity is maintained while innovation and growth continue. With SaaS applications and the right tools in place to support them with both end-to-end visibility and performance, oil and gas companies will be able to thrive in remote locations. ■

## PARTNERSHIP TO DELIVER SATELLITE-ENABLED IOT SERVICES TO OIL AND GAS OPERATORS

INMARSAT, THE GLOBAL, mobile satellite communications provider, has announced a new distribution partnership with Libyan telecoms operator, Rawafed Libya for Telecommunications and Technology (RLTT).

RLTT's specialist "Digital Oilfields" business unit will use Inmarsat's ELERA enabled satellite services – IsatData Pro and BGAN – to provide secure, satellite-based data services to oil and gas companies operating in Libya, including real-time infrastructure monitoring and telematics.

Digital Oilfields provides always-on, remote telematic and CCTV monitoring of vital infrastructure, including wellheads at oil and gas drilling sites and production sites across Libya. The services are delivered through Inmarsat's ELERA L-band connectivity network and benefit from ultra-reliable 99.9% availability, security and small-form, robust terminals.

The RLTT Digital Oilfields unit plans to expand its satellite-based offering to Libya's oil and gas companies with the addition of pipeline monitoring, plus vehicle telemetry, tracking, and fleet management.

"Oil and gas production is Libya's number one industry," said Taha Ellafi, chairman at RLTT. "Operators across the country are digitalising their operations to increase efficiency and output and improve on-site safety and security for staff. Our new partnership with Inmarsat puts RLTT in an excellent position to take full advantage of this growth opportunity. Working with Inmarsat, we can provide remote security monitoring to drilling and production facilities across the country – including inaccessible locations beyond the reach of terrestrial fixed and mobile networks."



*the partnership will provide satellite-based data services to oil and gas companies operating in Libya.*

Image Credit: Adobe Stock

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# Driving down intervention costs

Jordan Whyte, head of commercial & business development at Gulf Marine Services (GMS), explained to Oil Review Middle East how the company is facilitating more efficient heavy well intervention operations to save time and costs.

IN THE MIDDLE East, attention is firmly fixed on increasing production. While the energy transition has threatened to shake confidence, key players have reaffirmed their faith in the oil and gas market in the years ahead by looking to increase production – Saudi Arabia's Aramco has signalled its intention to increase oil production to 13mn bpd (up from 12mn bpd) and ADNOC is aiming to boost capacity to 5mn bpd (up from 4mn bpd).

Within the region, Whyte explained, one of the most favoured ways of increasing production is to workover existing wells using the likes of jack-up barges to re-stimulate wells in shallow waters. It is for this reason that of the 12 barges GMS currently has in the Middle East, around half of are presently engaged in some form of well service operations (there is another barge in the North Sea working in renewables).

“Covid-19 dramatically delayed a lot of contracts of course but, subsequently, these have been reactivated. Now it is in overdrive, driven by these production targets and allied to the large population of existing shallow water platforms; the simplest and most efficient ways to reach these is by using jack-up barges. While we are not downhole engineering experts, we are the medium to carry out these operations and currently have high utilisation levels due to the production boom,” Whyte said.

## GMS' evolving capacity

Standing apart in GMS' fleet is the Evolution self-propelled, self-elevating well intervention barge which was commissioned back in 2017. Fitted on board is the bespoke cantilever workover system, delivered in collaboration with Norwegian-based Dwellop.

This unit skids hydraulically from the main deck of the barge out of the back end for the best part of 50 ft; has a light weight drilling derrick that comes complete with top drive system; and has a high level of automation such as a pipe handling system that will pick pipe up off the deck and feed into the top



Image Credit: GMS

*The Evolution on location in North Field, offshore Qatar.*

drive before running in hole. There is also an automated iron roughneck on board and everything is run from a driller's cabin on the side of the unit so that pipe can be tripped in and out of the well at significant speeds (up to 1,000 ft an hour). Below the deck is also a full Mud System with everything normally associated with a drilling rig; enhancing the vessel's capacity.

Whyte remarked, “In a sense it is very similar to a jack-up rig but it is a hell of a lot lighter and thus can skid out over a platform much faster (typically only 30 mins). There is some transverse movement which means we can also skid left to right in order to workover adjacent wells without having to necessarily move the barge itself. When we do have to skid back, rig down and move elsewhere, we can typically do so and be ready to work at another location within 24 hours. This is significantly faster than a jack-up rig for

example which can take the best part of two to three days and even more if the weather is poor. Not to mention the fact no tug-boats are required to get it to the next location due largely to our clients comfort operating Evolution in DP-2 mode when approaching platforms. As a result, the Evolution can workover up to three or four times as many wells per year compared to a typical non-propelled drilling jack-up in any given field.”

“We are trying to bring down the costs of all brownfield workover operations and the Evolution offers flexibility and cost saving due largely to the superior marine efficiencies.”

The Evolution was purpose built for P&A and workover scopes but can also perform some drilling operations. Whyte noted that it is really only limited by the amount of tubular piping that can be carried on deck (and a few others such as top drive torque capability and hook load) and the 200t crane on board

means it even has the ability to remove small jackets although that has not been done to date.

In one case study provided by GMS, the Evolution was contracted by an Arabian Gulf NOC for a well intervention scope covering various operations. The barge jacked up alongside a similar vessel to transfer well services equipment (which was moved across and commissioned in a record two days) before sailing to the platform tower, jacking up and deploying the cantilever system. The unit was ready to commence operations with three hours (saving 90% rig time) and rig up of well services equipment was completed in 31 hours (achieving 15% time saving). Following this, rig down of well services and preparation for the barge to move was completed in just 14 hours.

### On the horizon

Currently, the Evolution is performing legacy work for Qatar Energy (QE) on a field which was previously operated by Occidental petroleum for around 25 years. The former owners used a more traditional method of workover which QE continued until GMS suggested that the Evolution would be more efficient. In the 18 months since then, the Evolution has been proving its worth and this is without even reaching its full potential.

“In truth we are not even at the stage where we are using Evolution at 100% of her capability but we are certainly working towards that. As it gets more tried and tested and both the crew and client gains confidence, we will be more prepared to tackle more difficult workovers and remediation projects. But it is fair to say that, so far, it is going well and QE appreciate the marine efficiencies being achieved,” Whyte noted.

Pushing the Evolution to greater heights is just one of the targets on the horizon for GMS, Whyte continued. The company has recently taken a big step in its digital journey by signing a contract to install an enterprise resource planning system which will provide the company with an interconnected system across its operations, giving it the ability to upgrade internal procedures; integrate vessel operations, maintenance, procurement and inventory control, alongside crew and payroll management; and centralise data for better visibility. Whyte surmised that while it will not be fully up and running for a couple of months yet, the company has already started to feel the

“Such is the boom and demand here that, at the moment, we are very focused on the Middle East region.”



Image Credit: GMS

*The Evolution was commissioned back in 2017.*

benefits (most notably in the real-time communication between offshore and onshore) which is a promising sign for the digital road ahead.

Another exciting development is through the delivery of a lighter cantilever system which the company is looking to push across the line for commercial use. This is, as it says on the tin, a lighter version of the system which can be used for all well services which do not require tubing to be pulled from the well.

Whyte said, “It can skid out just as far and can be retrofitted to existing vessels. There is a lot of interest from NOCs for this and we are looking for more opportunities for the cantilever system and its lighter cousin. As the rig rates continue to rise and move away from barges, we think our offerings will become increasingly more attractive to operators for both heavier and lighter workover operations.”

Finally, Whyte concluded by noting that the

company is keeping an eye on other regions for which its fleet could be deployed with regard to well service and workover operations.

“West Africa is finally waking up to well service-dedicated barges; in the North Sea there is some increased activity in terms of P&A; and there is interest from regions such as Asia and Australia to bring in some of our barges. The Evolution is capable of operating anywhere with water depth of around 70m and has proved herself in other regions such as the North Sea before,” Whyte continued.

“We put no barriers on where we work as long as the economics work out. That being said, such is the boom and demand here that, at the moment, we are very focused on the Middle East region. The Evolution itself has been working in Qatar for the last two years and fingers crossed we expect her to continue there for some time.” ■

# Inventory control with IoT radar

VEGA's Radar IoT solution provides timely and accurate knowledge of current inventory, the backbone for the implementation of any operation model.



Image Credit: VEGA

INVENTORY MONITORING IS a common task in the instrumentation field. Consider a remote location, e.g. a drilling site. There could be a number of tanks and silos with various materials, from solid chemicals to liquid mud, from special additives to common diesel, from drinking water to contents of septic tanks. Located in different corners of the site, different people are responsible for re-stocking and disposal. How do you have it under control at all times?

The modern day solution is a combination of the right instruments that carry out the actual measurement, the connectivity methods, retrieving the data from the instruments online, and the software solution that makes the data easy to see and handle. VEGA is one of the oldest and most reputed manufacturers in the field of industrial instrumentation. Today the company has the complete solution, from the non-contact Radar transmitters onsite to a mobile application on your phone.

## The new Radar VEGAPULS 6X – one sensor for all

VEGA has just launched the new Radar sensor VEGAPULS 6X. With an all-new approach you do not need to choose from a confusing broad range of devices. It is now a single device, which can be configured for your application; it can handle any measurement, no matter the medium, solid or liquid, under any conditions.

In addition to this flagship device, VEGA offers battery-powered autarkic Radar sensors, ready to connect from the most

remote location of your site.

VEGA Inventory System is the software solution which you will see in your computer browser, or in the app on your tablet or phone. It gives the live status of each monitored asset, notifications and alerts, and a complete data history. Convenient, but what is the actual value for asset management?

Consider for example a tank or a silo, which needs to be topped up regularly. One way to do it is to refill after every use; another is to use up most of it, then refill all at once. Which method is better? It depends on the priorities set by your operation.

A comparable example is: you do not stop to refill at every station along a highway – because you can always see the petrol level on your dashboard. Give yourself the same level of confidence in your operation.

Timely and accurate knowledge of current inventory is the backbone for the efficient implementation of any operation model. The VEGA Radar IoT solution provides you with this knowledge. ■

“ You do not stop to refill at every station along a highway – because you can see the petrol level on your dashboard.”

# Pursuing expansion opportunities in Saudi Arabia

James Dodgson, general manager, Byrne KSA, discusses the equipment rental company's activities in Saudi Arabia and future prospects.

## Can you tell us a bit about Byrne's presence in Saudi Arabia?

Since launching our KSA operations over 20 years ago, the company has expanded its footprint across the entire kingdom. Headquartered in Jubail, with offices and depots in Dammam, Riyadh, Turaif, Jeddah and Yanbu, we have wide coverage across the kingdom enabling us to service our clients effectively and efficiently.

Today, Byrne is one of the largest single sources for plant and equipment rental in Saudi with an extensive rental fleet of over 5,000 units of equipment which is growing rapidly to meet the current and anticipated future demand.

## How do you view the Saudi rental market currently, and how are you looking to expand your business in the kingdom?

The Saudi market is in one of the strongest positions we have seen since the start of the pandemic two years ago. Increased government spending on infrastructure, construction, events and oil and gas production is bolstering the pace of activities in the country. With Byrne's presence and coverage across all these sectors within the kingdom, we are confident on the immediate and future demand for rental equipment. Construction, events and oil and gas will play a huge part in Byrne's growth in the coming years. The Red Sea and Neom developments have presented a need for us to expand our bases to new territories in the north west regions of the country. This area is also showing promising signs of a big upturn in events and construction, for which we anticipate opportunities coming our way.

Oil and gas has always played a big part of Byrne's strategy in the region and has been a stable base for the rental market in the past.

“We have our sights firmly set on supporting this growth.”



Image Credit: Adobe Stock

*Oil and gas remains a core market sector for Byrne.*

Our focus here remains relatively the same; we will continue to listen to our customers' ever-changing needs and evolve in line with demand. We will continue to promote ourselves as the single largest equipment rental company in the region with our single source supplier motto, and look to grow our fleet and exposure to support this.

## Can you outline your services for oil and gas camps, and the prospects for development in Saudi Arabia?

We have established ourselves as one of the leading camp and service providers in the region. In recent years, we have witnessed a significant shift in our clients' requirements, changing from general plant and equipment supply to a turnkey service provider. Our clients want to reduce the time and resources spent on managing the support services related to their core operations. With the

ability to design, construct and operate camp facilities, Byrne is well equipped to fully support the increasing demand in the market.

Upstream oil and gas production is increasing at a rapid rate within the Kingdom; this, coupled with Saudi Aramco's recent announcements of releasing of new well sites, will predictably accelerate the demand for remote off-site camps and camp-related services. We have our sights firmly set on supporting this growth and increasing our exposure in this field and to support this, we have expanded our fleet of accommodation and camp facilities, set to arrive in the first quarter of this year.

## To what extent has the pandemic impacted your operations, and are there any new trends or customer requirements you are having to take into account?

In common with everyone else, the pandemic

has had a significant impact on our business and operations, most notably in the construction, events and oil and gas sectors. A major part of our operations is dedicated to focus on oil and gas production plants where we have had to balance the adverse effects of slowdown and postponement in planned shutdowns which typically would be a huge market for us. In addition, many organisations made reductions to their operations, another key area where we would typically supply our equipment and services.

The market has started to stabilise, and our efforts in maintaining our presence throughout the pandemic has paid off. At the start of the pandemic, we quickly shifted our priorities – we focused on our customers and realigned ourselves to support other efforts for our existing clients. For example, a company who usually rented site facilities and equipment for supporting their activities asked for our support in building remote medical facilities in support of the pandemic relief efforts.

This ability to adapt quickly and move with the ebb and flow of the market has always been one of our key strengths in being able to remain successful in a highly competitive landscape.



**James Dodgson, general manager, Byrne KSA.**

### **How are you contributing to local capacity building in Saudi Arabia?**

Saudization is a key pillar to our people strategy within the kingdom – we pride ourselves on the success our multinational team has achieved, a team that is greatly supported by our local Saudi talent pool. We have taken a proactive approach to hiring and

retaining local talent focusing on younger graduates who we can support further with their education and experience in the industry. We are committed to continuing our support for the Saudi nationalisation scheme.

### **What do you think is the secret of your success in the Kingdom as a rental solutions provider?**

Firstly, our establishment in KSA in 2001 made us one of the first movers in terms of a broad equipment offering, but even with that bank of experience our clients' priorities are forever evolving, and with the competitive landscape, we need to be adapting and evolving in line with them. We operate in a very competitive marketplace, however we have been able to strengthen our position in the market through excellent customer service, successful relationships and open communication.

We pride ourselves on our ability to adapt to our clients' needs and market fluctuations around us; this agility and many other success factors are only possible because of our people. Our people are, and will continue to be, the foundation to our success. ■

Image Credit : Byrne Group

## **New tool manufacturing and equipment rental company established**

A NEW TOOL manufacturing and equipment rental company which will bridge the gap between the hydrocarbon and renewables sectors has been launched in Aberdeen, UK. The new company, RenQuip Limited, is looking long-term at opening other strategic bases around the UK and overseas.

RenQuip will specialise in the design and manufacture of installation and maintenance tools for the energy industry, offering bespoke products, product sales and equipment rental.

In addition to distributing and selling its own branded OEM equipment globally, RenQuip has established agreements to act as a distributor for well-established equipment and tool brands.

RenQuip managing director, Marc Gerrard, said, "As a result of recent corporate acquisitions and restructuring in the sector, we have identified that there is a gap in the market for a reliable and experienced partner to service companies and operators in the energy space.

"A lot of expertise has left the industry which has resulted in a knowledge deficit, and we believe RenQuip can address this shortfall, and through new technologies deliver an unbeatable customer experience.

"While our extensive experience is in the traditional oil and gas sector, it will be a natural step for RenQuip to focus on delivering specialist tools and engineered solutions to the renewables industry."

RenQuip technical director, John Morgan, added, "Clients have told us there is a need for a business which can provide bespoke solutions where existing equipment can be modified or adapted, or new products can be developed for a specific application. With our strong background in engineering design and manufacturing, RenQuip will be in the ideal position to fill that requirement, and at the same time we will roll out our OEM products and those of internationally established manufacturers to a global client list."

RenQuip has the backing of energy sector entrepreneurs Doug



Image Credit: Adobe Stock

**The new company will specialise in the design and manufacture of installation and maintenance tools for the energy industry.**

Duguid and Michael Buchan and their investment company I7V Renewables, which provides insight, investment and support to new and emerging businesses.

Doug Duguid said, "Marc Gerrard was a highly valued member of the EnerMech management team and I am delighted that I7V Renewables are able to support him and John Morgan in launching this forward-looking business, which I am confident will set the template for tool and equipment rental and sales in the oil and gas sector, and appeal to businesses engaged in energy transition and working to achieve net-zero."

# Redefining process gas measurement

Apurva Sharma, industry manager O&G at Endress+Hauser, describes how the company's new Prosonic Flow G ultrasonic flowmeter 300/500 provides reliable wet gas measurement even under demanding conditions.

**S**EPARATORS ARE TYPICALLY used to physically separate the multiphase flow from oil wells consisting of gas, oil, water, condensate or even sand, and to measure each fluid in a single phase. Separation is common practice and a good solution for dividing the multiphase flow into individual streams of oil, water, and gas. The most common separators are two-phase or three-phase units that separate gas from liquid or gas, oil, and water respectively.

Theoretically, this approach works well, but it assumes that process conditions are stable over time and match the conditions the separator is designed for to work effectively. Unfortunately, stable conditions are rare, and high liquid-loaded gas conditions can occur not only in start-up situations but also during the lifetime of a well, because of liquid carry-over in gas leg.

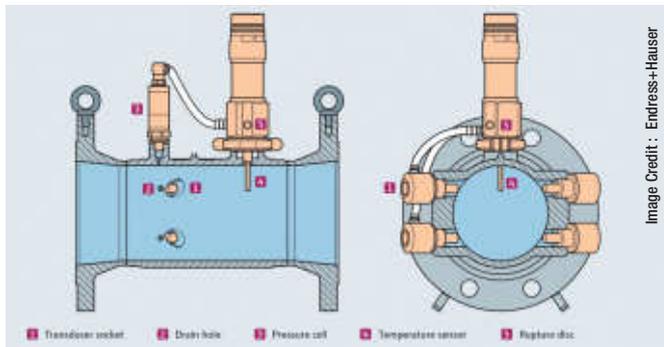
## Innovations and design improvements

To meet the growing demand of the industry to measure gas reliably under less ideal, demanding conditions such as low pressure, changing conditions, high turndown and especially for wet gases in separator gas-leg, Endress+Hauser designed and developed the new ultrasonic flowmeter Prosonic Flow G 300/500.

One of the most difficult challenges in wet gas measurement occurs when liquid and/or condensate accumulate in and around the transducer and transducer socket. If enough liquid collects, it forms an acoustical shortcut and leads to parasitic ultrasonic noise.

This noise needs to be minimised, so that the ultrasonic flow signal to noise ratio remains satisfactory for stable flow measurement. To reduce the chance that liquid and/or condensate accumulate in and around the socket and transducer, various innovations have been implemented into the device.

**1.** The sensor sockets are oversized in diameter to increase the distance between socket and transducer. Compared to traditional ultrasonic meters, this distance is rather large. This optimised socket



New design features allow the meter to operate continuously at high liquid loads.



The Prosonic Flow G 300/500 flowmeter.

Image Credit: Endress+Hauser

size and shape improve the robustness against wet gas significantly, as the probability of bridging this large distance is less.

**2.** A second feature is a drainage channel connecting each sensor socket with the measuring tube. This channel allows liquid that drains down the piping and meter wall to flow out of the socket before it collects there. This avoids the unwanted bridging effects between the transducer and socket gap.

**3.** Another important aspect is the development of fully metallic titanium transducer design based on a longitudinal vibration mode. The advantages of this sophisticated design are high pressure capability and excellent chemical resistance, combined with mechanical robustness.

These new design features allow the meter to operate continuously at high liquid loads. The maximum possible availability of the flowmeter, despite extreme wet gas conditions, is thus guaranteed at all times.

Wet gas measurement has been, and will continue to be, a challenging measurement application which is often unavoidable in many different areas of the process industries, especially in the unconventional oil and gas production fields.

Innovative design has made it possible to build an ultrasonic flowmeter specifically designed to provide a reliable, repeatable, and robust wet gas measurement, even under the demanding conditions that we see in many different industries. Not only can such a meter ensure a reliable measurement with a higher availability, but the reduction of both capital and operational expenses also delivers significant value in wet gas measurement points in many fields of application. ■

For further information, see <https://eh.digital/3Lm8bme>

## Lloyd's Register announces AllAssets 3.0 update

LLOYD'S REGISTER, A professional services company specialising in engineering and technology solutions, is set to roll out AllAssets 3.0, its asset performance and risk management solution offering operators and asset owners the ability to supercharge their understanding of their assets and make better operational, reliability and environmental decisions.

AllAssets 3.0 is the latest major update to the solution, due to roll out to customers in March 2022. The software updates include increased inspection data capability and tracking, improved data transfer to enhance usability of the risk-based inspection modules, and updated security set-up providing finer control over data access, amongst other key enhancements.

AllAssets allows businesses to quantify their risk exposure and prescribe the most effective inspection and maintenance plans dramatically reduction unplanned downtime. The cloud-based software has seen customers reduce risk of failure by up to 95% and, with safety and integration in mind, aims to eliminate data siloes and increase asset performance.



Image source: Adobe Stock

*The software helps operators to improve asset performance.*

## Schlumberger introduces GeoSphere 360 3D reservoir service

SCHLUMBERGER HAS LAUNCHED the GeoSphere 360 3D reservoir mapping-while-drilling service, which leverages advanced cloud and digital solutions to deliver real-time 3D profiling of reservoir objects.

“GeoSphere 360 service is the pinnacle of reservoir mapping while drilling and the first in a series of digitally enabled technologies and services that we will bring to market this year. Unlike conventional technologies, 3D reservoir mapping while drilling identifies fluid bodies and faults – at a volumetric reservoir scale – which is unique in the industry,” said Jesus Lamas, president, well construction.

Geomodelling at the reservoir scale delivers 3D characterisation of structural, stratigraphic and lithographic features of the reservoir, which increases geosteering confidence. The GeoSphere 360 service uses a unique combination of advanced cloud and computing solutions and digitally enabled hardware to acquire 3D electromagnetic data.

The GeoSphere 360 service has undergone extensive field testing in various environments globally.

## Dropsafe launches expanded Helideck Safety Net range

IN RESPONSE TO increased industry demand from the energy, marine and healthcare sectors, Dropsafe has expanded its Helideck Perimeter Safety Net range. Dropsafe now offers two different versions of the net, ensuring that all facilities can access a tailored safety solution according to their budget, location and facility requirements. The stainless-steel Helideck Perimeter Safety Net system attaches to the perimeter frames of helidecks to protect personnel or objects from falling.

Mike Rice, Dropsafe commercial director, commented, “From harsh offshore environments to hospitals, helidecks are critical entry points where safety is paramount – and extended periods of downtime are unacceptable. This has driven growing demand as activity ramps up across multiple sectors, leading rig managers to push for cost-effective solutions to mitigate safety risks around the helideck, such as Drops or Man Overboard incidents.”

The 316 stainless-steel Helideck Perimeter Safety Net system attaches to the perimeter frames of helidecks to protect personnel from falling. The system is designed to withstand an impact greater than 2.3 kJ (100kg at 2.35 metres), exceeding global helideck standards. Dropsafe also scrutinised prevailing testing practices for helideck nets. With increasing industry recognition for safer, non-destructive alternatives, Dropsafe is looking to create a new testing option in line with operator requirements.



Image source: Dropsafe

*Dropsafe Helideck Perimeter Safety Net System.*

## Unity launches new range of compact well integrity technologies

UNITY, EUROPE'S LARGEST provider of well integrity solutions, has launched a new range of compact technologies to solve common industry challenges including working space, component weight and personnel on board (POB) restrictions. The technologies will be used to support Unity's surface well integrity, shallow intervention and well decommissioning services.

For offshore operations, the new products reduce well bay space requirements, simplify and accelerate offline mobilisation and reduce POB, cost and risk. Due to these efficiencies, the products all offer between 50-75% savings in OPEX.



*Unity's new compact VR tool.*

The new technology range includes a compact dual-bore xmas tree isolation system, a compact valve removal tool and a compact shear-seal valve. The products complement Unity's existing Surface Intervention System (SIS), the first product in this compact technology range, already delivering multi-functional operations such as inspection, plug setting, milling and xmas tree removal at reduced cost and improved efficiency compared to wireline or coiled tubing intervention.

Unity's new dual-bore xmas tree isolation system has a footprint of 1.5 sq. ft. with an operating height of only 6ft above the well cap. It can be mobilised and deployed rapidly for shallow plug setting, particularly suited to support and reduce the cost of P&A operations. It can be deployed offline without the need for traditional intervention equipment, saving around 60-75% or more per well. Time savings from rig-up to rig-down are in the order of 2-3 hrs compared to 2-3 days for wireline or coiled tubing interventions.

The new compact shear-seal valve is designed to reduce the weight and geometry of intervention pressure control equipment. It utilises a hydraulically actuated ram but is 50% lighter and 30% smaller than the next closest comparable product.

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# Project Databank

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## OIL, GAS AND PETROCHEMICAL PROJECTS, BAHRAIN

Project Name	City	Facility	Budget (US\$)	Status
Tatweer - NAG Long Term Field Development (LTFD) - Phase 2 - Gas Dehydration Unit (GDU)	Awali	Non Associated Gas	5,00,00,000	Construction
Tatweer - NAG Long Term Field Development (LTFD) - Overview	Awali	Non Associated Gas	90,00,00,000	Construction
BAPCO - BAPCO Modernization Program (BMP) - Overview	Sitra	Petroleum Oil	6,00,00,00,000	Construction
BAPCO - BAPCO Modernization Program (BMP) - Residue Conversion Unit	Sitra	Petroleum Oil	80,00,00,000	Construction
Tatweer - NAG Long Term Field Development (LTFD) - New Well Manifolds Facilities	Awali	Non Associated Gas	20,00,00,000	Engineering & Phase 2 - Two Procurement
Tatweer - De-Bottleneck Gas Distribution Network - Hidd Metering Station (HMS) to Wharf Valve Station (WVS)	Various	Welded, Gas Pipeline	8,00,00,000	Engineering & Phase 1 - Procurement
NOGA - Aromatics Complex	Sitra	Aromatics, Toluene Di-Isocyanate, Xylene, Benzene	1,00,00,00,000	Feasibility Study
Tatweer - NAG Long Term Field Development (LTFD) - Non-Associated Gas Compression Facilities (NCF)	Awali	Non Associated Gas	22,00,00,000	Engineering & Phase 2 - Procurement
NOGA - Offshore Blocks 1,2,3,4 Exploration and Production - Overview	Various	Offshore Exploration	80,00,00,000	Construction
Tatweer - NAG Long Term Field Development (LTFD) - Phase 2 - Remote Gas Dehydration Units	Awali	Non Associated Gas	20,00,00,000	EPC ITB
Tatweer - NAG Long Term Field Development (LTFD) - Rigs and Associated Services	Awali	Gas Field	15,00,00,000	Engineering & Phase 2 - WO Procurement
Tatweer - NAG Long Term Field Development (LTFD) - Phase 2 - Wellhead Compression Facilities	Awali	Non Associated Gas	4,00,00,000	EPC ITB
BAPCO - Awali Field - Khuff Gas Development	Awali	Gas Field Development, Non Associated Gas	10,00,00,000	EPC ITB
GPIC - Khaleej Al Bahrain Basin - Gas Projects	Various	Petrochemical Plant	1,65,00,00,000	Feasibility StudyWestern Desert Gas Processing Plant

### Middle East oil and gas vital for stability: GlobalData

MIDDLE EAST OIL and gas will become increasingly vital to stabilise the energy markets, given the prospect of reduced or blocked Russian oil and gas exports, says GlobalData's MEED.

Richard Thompson, editorial director at GlobalData's MEED, comments, "Long-term uncertainty about Russian oil and gas supplies will sustain high energy prices for a prolonged period and create a renewed focus on Middle East hydrocarbons that will underpin a new economic and projects boom in the Gulf."

The immediate impact of Russia's invasion of Ukraine was to trigger massive volatility in global capital markets and a spike in commodity prices that has added to the inflation fears already threatening the global recovery. However, the strategic impact of the crisis is to expose Europe's overdependence on Russian energy, particularly its gas.

As a result, the coming months and years will see a strategic realignment of global energy and a European diversification away from Russian oil and gas supplies to alternative sources such as renewables, coal, nuclear and Middle East hydrocarbons.

Thompson says, "In the longer term, unless a peace settlement is reached soon, Moscow's actions in Ukraine will see Russian oil and gas exports

reduced or even blocked altogether from the global energy supply chain."

The mere prospect of oil and gas sales from the world's third-biggest oil producer and second-biggest producer of natural gas being removed from the international market saw oil prices surge, and they remain volatile.

In the short term, the surge in oil prices delivers a financial windfall to Middle East oil producers, who will use the money to accelerate post-pandemic stimulus infrastructure in 2022.

Over the longer term, with rising inflation creating huge economic headwinds for the global economy, Middle East oil and gas will become increasingly vital to stabilise the energy markets.

Thompson notes, "With its liquefied natural gas (LNG) expansion programme underway, Qatar is well placed to become a major natural gas supplier to Europe, while Saudi Arabia, the UAE and the region's other oil and gas producers are well positioned to increase their supplies of low-cost energy.

"Meanwhile, Libya, Iraq and Algeria will see renewed efforts to bring their hydrocarbons back on stream in a major way."

The Gulf's oil producers have abundant supplies of low-cost oil and gas reserves, and are investing heavily to increase production capacity.



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# Project Databank

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## Project Focus

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### Tatweer - NAG Long Term Field Development (LTFD) - Phase 2 - Gas Dehydration Unit (GDU)

<b>Name of Client</b>	Tatweer Petroleum
<b>Estimated Budget (US\$)</b>	50,000,000
<b>Award Date</b>	2020-Q2
<b>Main Contractor</b>	Petrofac
<b>Facility Type</b>	Non-Associated Gas
<b>Status</b>	Construction
<b>Location</b>	Awali, Bahrain
<b>Project Start</b>	2018-Q2
<b>End Date</b>	2023-Q4

### Background

The Non-Associated Gas (NAG) Long-Term Field Development (LTFD) project is a continuation of Tatweer's commitment to secure the delivery of natural gas needed to meet the growing demand for power demands of the Kingdom of Bahrain. Phase 2 of the project will include two new gas processing trains as well as additional wells and infrastructure to deliver the gas to the processing facilities.

### Project Status

Date	Status
Feb 2022	The civil work is ongoing, while the other works are expected to start by Q3 2022.
Nov 2021	The construction work has started.
Sep 2020	Petrofac has started the engineering work.
Jun 2020	Tatweer has awarded the engineering, procurement, construction, and commissioning (EPCC) contract for the 24 Pre-Unayzah gas well hookups, associated pipelines, and tie-ins at the GDUs to Petrofac.
Aug 2018	After the completion of the centralized gas dehydration project for Tatweer, Petrofac is awarded a contract to build additional gas wells and pipelines which will be used to connect the new wells to the current and future processing facilities.
Jul 2018	Tatweer has released a tender for the EPC contract for the two 500 MMSCFD Gas Dehydration Unit (GDU) trains.

### Project Scope

The scope of the project includes:

- Building two 500mn standard cubic feet/day (MMSCFD) gas dehydration unit (GDU) trains (Trains 2 & 3)
- Associated gas dehydration facilities
- Gas wells
- Pipelines
- Gas well hookups
- Associated infrastructure
- Tie-ins for several new gas wells

## 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	FEBRUARY 2022			VARIANCE From January 2022	JANUARY 2022		
	Land	OffShore	Total		Land	OffShore	Total
<b>Middle East</b>							
ABU DHABI	26	8	34	-4	27	11	38
DUBAI	0	0	0	0	0	0	0
IRAQ	46	0	46	0	46	0	46
JORDAN	0	0	0	0	0	0	0
KUWAIT	28	0	28	+3	25	0	25
OMAN	47	0	47	+3	44	0	44
PAKISTAN	16	0	16	0	16	0	16
QATAR	3	7	10	-2	4	8	12
SAUDI ARABIA	58	9	67	-3	61	9	70
YEMEN	1	0	1	0	1	0	1
<b>TOTAL</b>	<b>225</b>	<b>24</b>	<b>249</b>	<b>-3</b>	<b>224</b>	<b>28</b>	<b>252</b>

### North Africa

ALGERIA	26	0	26	-6	33	0	33
EGYPT	24	10	34	-1	22	11	33
LIBYA	15	0	15	0	15	2	15
TUNISIA	2	0	2	0	2	0	2
<b>TOTAL</b>	<b>67</b>	<b>10</b>	<b>77</b>	<b>-7</b>	<b>72</b>	<b>11</b>	<b>83</b>

Source: Baker Hughes

رغبتها في أن تصبح مركزا رئيسيا للطاقة في شرق المتوسط، وهي المنطقة التي شهدت كذلك اكتشاف كميات كبيرة من الغاز قبالة سواحل إسرائيل وقبرص. فضلا عن الغاز الطبيعي المسال، يشمل جزء محوري من هذه الخطط إنشاء شبكة من خطوط الأنابيب لإمداد دول المنطقة كلبان والأردن وسوريا بالغاز، بالإضافة إلى غرورها القديم إسرائيل. وهذه الشبكة تمتد أيضا إلى دول جنوب أوروبا. فقد أعلن مسؤولون في اليونان - مؤخرا - أن بلادهم عازمة على تكثيف التعاون مع مصر بشأن إمدادات الغاز الطبيعي المسال، واستكشاف إمكانية إنشاء خط أنابيب بحري للغاز بين البلدين. كما تجري محادثات مع دول أوروبية أخرى كإيطاليا، وذلك بفضل مائة العلاقات بين البلدين بالنظر إلى الدور الكبير الذي تلعبه «إيني» في قطاع الغاز المصري.

كما تتطلع القاهرة، على مدى السنوات القليلة المقبلة، إلى إضافة قيمة إلى صادراتها أيضا، وذلك من خلال الاستثمار في معالجة النفط والغاز المحلي والتكرير والبتروكيماويات. وتأمل في زيادة الصادرات من قطاع الكيماويات إلى 10 مليارات دولار على الأقل بحلول عام 2025 مثلا، وفقا للخطة التي وضعها المجلس التصديري للصناعات الكيماوية والأسمدة. فضلا عن زيادة الصادرات، فهذا يشمل التركيز على الأسواق الدولية الجديدة، لا سيما في إفريقيا، لتحقيق أهداف المبيعات.

كما أحرزت الدولة تقدما في استراتيجيتها لنزع الكربون من خلال توقيع اتفاقية بين الهيئة العامة للبتروكيمياويات وشركة «بيكر هيوود» في فبراير/شباط لتأسيس مبادرة لاسترجاع غاز الشعلة للمساعدة على الاستفادة من غاز الشعلة وتقليل الانبعاثات في العمليات التي يشهدها قطاع الصناعات الاستخراجية والتحويلية للنفط والغاز في مصر. وبعد نحو عقد حافل بالتحديات، فضلا عن مختلف حالات الضبابية التي اعترت العاملين المنصرمين جراء أزمة كورونا (كوفيد-19)، فقد عاد قطاع الغاز الطبيعي في مصر للعمل من جديد.

«شمال دمياط» ببدء الإنتاج من اكتشاف «القطامية» في عام 2020. وبالنظر إلى المستقبل، فمن المتوقع أن تساهم إمدادات مشروع «ساتيس ويست»، وهو أول حقل يعود للعصر الروبيني في دلتا النيل، في تعزيز اكتشاف «القطامية». وذلك بحلول عام 2024 بجانب مشروع «هارمتان» الجديد.

ولا شك أن كل هذا النجاح في قطاع الصناعات الاستخراجية يحفز الاستثمار في المشاريع الصناعية في مصر أيضا. ذلك أن كلا من شركة «بي بي» وشركة «إيني» من المساهمين في «الشركة المتحدة لمشتقات الغاز»، وهي عبارة عن محطة لسوائل الغاز الطبيعي، لاستخراج غاز البترول المسال والبروبان، بالشراكة مع شركة «جاسكو» المصرية لتوزيع الغاز. وتضيف «المتحدة لمشتقات الغاز» قيمة من خلال استخراج غاز البترول المسال والغاز المكثف اللازمين للسوق المحلي. هذا فضلا عن إنتاج البروبان، وهو لقيم مهم لتوسيع صناعة البتروكيماويات في مصر. كما اجتذب انتعاش قطاع الغاز في مصر مجموعة من صغار ومتوسطي المستثمرين؛ مثل شركة «إيه بي إيه» الأمريكية، وشركة «ثرانس جلوب إنرجي» الكندية، وشركة «دانة غاز» التي تتخذ من الإمارات مقرا لها، وغيرها الكثير. وينتظر شركة «إيه بي إيه» (أباتشي كورب سابقا) عام حافل بالعمل، إذ بلغ عدد برمجاتها بالفعل 11 برجة خلال عام 2021. وتعتزم تنمية استثماراتها هذا العام، كما ورد في تصريح للسيد جون كريستمان، رئيسها ومديرها التنفيذي، جاء فيه أن الشركة حريصة على «إعادة مصر إلى مرحلة تنامي الإنتاج والمساعدة على النهوض بها كمركز إقليمي للطاقة». كما تأمل شركة «دراجون أويل» الإماراتية زيادة إنتاجها في مصر، وذلك بعد اكتشافها الكبير في خليج السويس خلال شهر فبراير/شباط.

## المبيعات العالمية

على ضوء كل هذا الاستثمار في قطاع الصناعات الاستخراجية، تكمن استراتيجية القاهرة طويلة الأجل في

تجاه الدولة المصرية. وتشمل التقسيمات الجديدة تقسيم «إيجي-ميد-إي 5»، بالشراكة مع شركة «بي بي» (بريتيش بترولوم)، وهي واحدة من أبرز الشركات الأخرى التي حرصت على الاستكشاف في المياه المصرية لعدة سنوات. وتعتبر «إيني» الآن المنتج الرئيسي في مصر، وهو لقب من الواضح أنها حريصة على عدم التفريط فيه. وقالت في بيان صحفي: «تتفق نتائج المناقصات مع إستراتيجية «إيني» لمواصلة استكشاف وإنتاج الغاز لتوفير احتياجات السوق المحلي المصري، والمساهمة في تصدير الغاز الطبيعي المسال، وذلك بفضل إعادة تشغيل محطة دمياط للغاز الطبيعي المسال مؤخرا». وقالت إن جميع التراخيص الجديدة تشمل «أحواضا غزيرة الإنتاج» تتمتع بأنظمة بترولية مثبتة قادرة على توليد كل من السوائل والغاز. وأضافت «إيني» في بيانها أن تلك المناطق يمكنها الاعتماد كذلك على محطات الإنتاج والمعالجة القريبة منها وعلى سوق تسمح بسرعة تقييم أي اكتشافات يمكن أن تتوصل إليها عملية الاستكشاف. كما يجري اكتشاف المزيد من النفط الخام، إذ أوضحت «إيني» الستار عن اكتشاف في امتيازها في حقل «مليحة» بالصحراء الغربية منذ عام. وهذا الاكتشاف يضيف 10 آلاف برميل من النفط يوميا إلى إجمالي إنتاج «إيني» من المنطقة التي تشارك فيها مع شركة «لوك أويل» الروسية والهيئة المصرية العامة للبترول.

## الاستثمارات الجارية

توجد شركات رئيسية أخرى على نفس القدر من الحرص على استغلال إمكانات قطاع الصناعات الاستخراجية في مصر؛ أمثال شركة «بي بي» المساهمة في امتياز «شروق» الذي يضم حقل «ظهور» العملاق للغاز بنسبة 10 في المائة. وبعد مشروع حقل «أتول» أحد المشاريع الضخمة المحلية التي تجربها الشركة، وقد انطلق في عام 2018، وينتج الآن نحو 300 مليون قدم مكعب يوميا لشبكة الغاز الوطنية المصرية. كما تعزز إنتاجها من امتياز

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اكتشافات بحرية مهمة تمت خلال السنوات الأخيرة

## مصر تسعى لتصبح مركزاً إقليمياً للطاقة

في هذا المقال يقول مارتن كلارك إن النجاحات غير المسبوقة التي أحرزتها مصر في قطاع الصناعات الاستخراجية، خلال السنوات الأخيرة، تدل على أنها أخذت الآن من جديد تعيد تركيز انتباهها على فرص التصدير. فهذه مصر تستقر في مصاف رائدي الغاز على مستوى العالم على إثر سلسلة من الاكتشافات البحرية المهمة خلال السنوات القليلة الماضية. إذ وفرت هذه الاحتياطات، من حقول كحقل «ظهر» وحقل «نورس»، الركائز الأساسية للدولة لإعادة تصدير الغاز، هذا فضلاً عن المساعدة على تلبية الطلب المحلي المتزايد.

### الاهتمام بقطاع الصناعات الاستخراجية

يشهد قطاع الصناعات الاستخراجية تحولا كبيرا، وينتشر بفضل الاكتشافات البحرية المذهلة التي شهدتها العقد الماضي. فلا يزال الاهتمام بقطاع الصناعات الاستخراجية في ذروته بعد جولة المناقصات الأخيرة التي شهدت هيمنة شركة «إيني» الإيطالية على القطاع لما لها من دور بطولي في إحياء طموحات مصر مؤخرا. فقد حصلت في مطلع عام 2022 على خمسة تراخيص استكشاف أخرى تغطي مناطق في شرق المتوسط والصحراء الغربية وخليج السويس، وهذا يؤكد على التزامها الدائم

الطبيعي المسال» مؤخرا. فقد أنتجت خلال العام المنصرم أول شحنة لها من الغاز الطبيعي المسال منذ إغلاقها في عام 2012، وهذا يمثل إنجازا مهما في عودة مصر إلى طريق المجد. وتبلغ الطاقة الإنتاجية لمحطة الإسالة، المملوكة لشركة «سيجاز»، 7,56 مليار متر مكعب سنويا. وعلاوة على ذلك، عادت الحياة لمشروع «خط الغاز العربي» الذي يربط مصر بشركائها الآخرين في شرق المتوسط، ومن المتوقع الانتهاء من المرحلة الأولى لإصلاح الخط مطلع العام الجاري للسماح بتوصيل الغاز المصري إلى لبنان.

يعتقد الخبراء أن حقل «ظهر» يعتبر أكبر اكتشاف للغاز الطبيعي في التاريخ في قلب البحر المتوسط. وهكذا تنبؤي القاهرة من جديد في استكشاف صادرات الطاقة إلى دول الجوار، وذلك بعد فترة هدوء وسط مخاوف بشأن تناقص احتياطات هذا الحقل، وإذا بهذه الدولة الواقعة في شمال إفريقيا تستعيد قدرتها الكاملة على تلبية الطلب المحلي على الغاز، وبوسعها الآن تخصيص فائض الإنتاج للتصدير من خلال محطات الغاز الطبيعي المسال ومختلف مبادرات خطوط الأنابيب. ويشمل ذلك إعادة تشغيل «محطة دمياط للغاز

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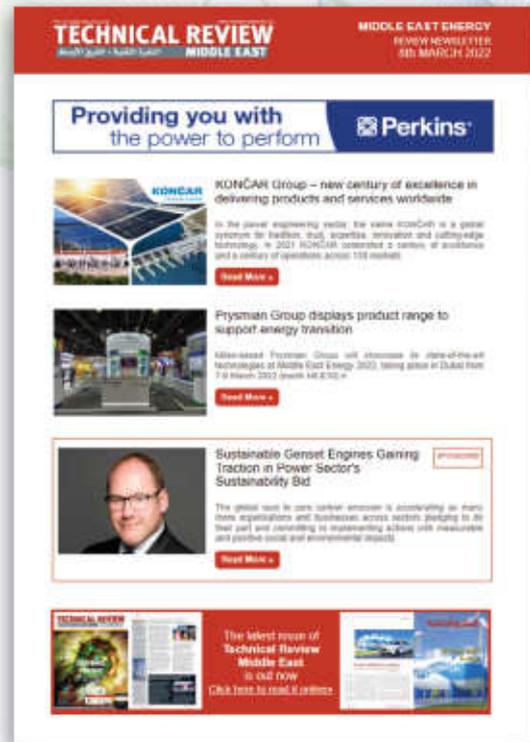
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# النشرة النفطية

المجلد 25 العدد الثاني 2022

الشرق الأوسط

## مصر تسعى لتصبح مركزاً إقليمياً للطاقة

النجاحات غير المسبوقة التي أحرزتها مصر في قطاع الصناعات الاستخراجية، خلال السنوات الأخيرة، تدل على أنها أخذت الآن من جديد تعيد تركيز انتباهها على فرص التصدير.