

# Oil Review

Oil · Gas · Petrochemicals

Middle East

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## Embracing the drive to net zero

- ADNOC progresses energy transition goals
- ADIPEC Preview
- Unlocking Iraq's untapped oil & gas resources
- The future of digitalisation for health and safety
- Improving operations with Smart Digital Reality

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## → Editor's note

THE RECENT TURMOIL in the oil markets and geopolitical concerns sparked by the conflict in Ukraine have brought energy security to the fore, as well as impacting the progress of the energy transition. ADIPEC 2022 will provide a forum to discuss solutions to the energy security and sustainability challenges, including how to respond to current global energy market situation while delivering on climate action and sustainability commitments. The energy trilemma of balancing cost, sustainability and security has never been more in focus. As ever, the latest innovative technologies to help oil and gas companies improve their operations will be on show; take a look at our preview on p34 for all the exhibitor news. And if you are attending the event, do visit our stand (AB02).

Elsewhere, we look at how ADNOC is balancing its traditional hydrocarbon activities with nurturing clean and sustainable technologies (p16), how digital transformation can improve operations in health and safety (p20) and whether Iraq can unlock its phenomenal hydrocarbons resources (p24).

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## → Executives' Calendar, 2022-2023

OCTOBER			
30-3 Nov.	<b>ADIPEC</b>	ABU DHABI	<a href="http://www.adipec.com">www.adipec.com</a>
NOVEMBER			
30	<b>Leadership Excellence Awards &amp; Symposium</b>	MANAMA	<a href="http://www.lewa-symposium.org">www.lewa-symposium.org</a>
JANUARY 2023			
16-18	<b>World Future Energy Summit</b>	ABU DHABI	<a href="http://www.worldfutureenergysummit.com">www.worldfutureenergysummit.com</a>
17-19	<b>Intersec</b>	DUBAI	<a href="http://www.intersec.ae.messefrankfurt.com">www.intersec.ae.messefrankfurt.com</a>
22-24	<b>Middle East Energy &amp; Sustainability Forum</b>	MANAMA	<a href="http://www.europetro.com/events">www.europetro.com/events</a>
25-26	<b>Middle East Bottom of the Barrel Conference</b>	MANAMA	<a href="http://www.europetro.com/events">www.europetro.com/events</a>
FEBRUARY 2023			
13-15	<b>EGYPS</b>	CAIRO	<a href="http://www.egyps.com">www.egyps.com</a>
13-15	<b>GDA Int'l Downstream Conference &amp; Exhibition</b>	MANAMA	<a href="http://www.gdaconference.org">www.gdaconference.org</a>
19-21	<b>MEOS GEO</b>	MANAMA	<a href="http://www.meos-geo.com">www.meos-geo.com</a>
28-2 March	<b>International Energy Week</b>	LONDON	<a href="http://www.iweek.co.uk">www.iweek.co.uk</a>
MARCH 2023			
7-9	<b>Middle East Energy</b>	DUBAI	<a href="http://www.middleeast-energy.com">www.middleeast-energy.com</a>

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

### Energy Future: Infinite Possibilities

THE 8TH LEADERSHIP Excellence for Women Awards & Symposium (LEWAS) will be held on 30 November 2022 at The Art Hotel & Resort, Kingdom of Bahrain.

Focused on 'Energy Future: Infinite Possibilities', the 2022 theme highlights the role of leadership and innovation for a sustainable tomorrow. The 2022 agenda will spotlight talent, economic and business trends in energy.

LEWAS began in 2013 with the objective to engage, empower and elevate women in energy. Since its inception, it has recognised and honoured women who are not only making a mark but are also being an advocate for women empowerment in the Middle East. The platform celebrates women who have consistently pushed boundaries, having shown excellence by producing tangible and path-breaking leadership traits, raising the bar for gender diversity, and finding new avenues to address inclusion issues.

Now in its eighth edition, LEWAS 2022 engages, empowers, and elevates issues that are at the very heart of the energy industry. What makes LEWAS even more important is in addition to recognising women, it also recognises male advocates and corporations who champion women in energy, enabling



LEWAS 2021 committee and prizewinners.

women to shatter stereotypes and support the industry to advance.

The Leadership Excellence for Women Awards recognises outstanding women in the energy industry who have excelled professionally and personally through their unmatched contributions in the areas of leadership, innovation, talent, research, and outreach.

There are seven award categories ranging from academic excellence to technical. Open

to women of age 18 onwards and all nationalities based in the Middle East, LEWAS encourages students, academia, line managers, business directors, scientists, owners, content creators, government, and private sector members to participate, as long as they have worked in their capacity to make the energy industry a better place.

For further information see the website at [www.lewa-symposium.org](http://www.lewa-symposium.org)



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## Growth in fossil fuel emissions slowing - IEA

THE GROWTH OF renewables and electric vehicles is holding down global CO<sub>2</sub> emissions from fossil fuels in 2022, according to the latest research from the International Energy Agency (IEA).

Despite concerns about the effects of the current energy crisis, global carbon dioxide (CO<sub>2</sub>) emissions from fossil fuel combustion are expected to grow by just under 1% this year, only a small fraction of their increase last year, as a strong expansion of renewables and electric vehicles prevent a much sharper rise.

New IEA analysis of the latest data shows that these CO<sub>2</sub> emissions are on course to increase by close to 300mn tonnes in 2022 to 33.8bn tonnes – a far smaller rise than their jump of nearly 2bn tonnes in 2021, which resulted from the rapid global recovery from the economic crisis triggered by the pandemic. This year's increase is driven by power generation and by the aviation sector, as air travel rebounds from pandemic lows.

Even though the energy crisis sparked by Russia's invasion of Ukraine has propped up global coal demand in 2022 by making natural gas far more expensive, the relatively small increase in coal emissions has been considerably outweighed by the expansion of renewables. Global energy trends have also been affected this year by the impacts of Russia's war on the world economy, which have significantly dampened expectations for economic growth, notably in Europe.

The combined result is that the CO<sub>2</sub> intensity of the world's energy supply is set to improve slightly in 2022, resuming a years-long trend of consistent improvement that was disrupted last year by the emissions-intensive economic recovery from the Covid crisis.

"The global energy crisis triggered by Russia's invasion of Ukraine has prompted a scramble by many countries to use other energy sources to replace the natural gas supplies that Russia has withheld from the market. The encouraging news is that solar and wind are filling much of the gap, with the uptick in coal appearing to be relatively small and temporary," said IEA executive director Fatih Birol. "This means that CO<sub>2</sub> emissions are growing far less quickly this year than some people feared – and that policy actions by governments are driving real structural changes in the energy economy. Those changes are set to accelerate, thanks to the major clean energy policy plans that have advanced around the world in recent months."

Solar PV and wind are leading an increase in global renewable electricity generation in 2022 of more than 700 terawatt-hours (TWh), the largest annual rise on record. Without this increase, global CO<sub>2</sub> emissions would be more than 600mn tonnes higher this year. The rapid deployment of solar and wind is on course to account for two-thirds of the growth in renewable power generation. Despite the challenging situation that hydropower has faced in several regions due to droughts this year, global hydropower output is up year-on-year, contributing over one-fifth of the expected growth in renewable power.

While electricity generation from both wind and solar PV is growing far more than any other source in 2022, coal is expected to post the next largest increase as some countries revert to coal use in response to soaring natural gas prices. In total, global CO<sub>2</sub> emissions from coal-fired power generation are set to grow by more than 200mn tonnes, or 2%, this year, led by increases in Asia.

As well as the challenges for hydropower in some regions, the world's low-emissions electricity supply has suffered a setback from a series of nuclear power plant outages, which are set to reduce global nuclear power production by over 80 TWh. This has largely been due to more than half of France's fleet of nuclear reactors being offline for part of the year. The drop in nuclear power generation globally has contributed to an increased use of coal and oil for electricity generation. The world's use of natural gas is expected to decline following Russia's invasion of Ukraine, resulting in a decrease in CO<sub>2</sub> emissions of around 40mn tonnes in 2022.

Demand for oil is set to grow more than for any other fossil fuel in 2022, with oil-related CO<sub>2</sub> emissions up by around 180mn tonnes. This has been driven largely by the transport sector as travel restrictions have been lifted and pre-pandemic commuting and travel patterns have resumed. Aviation is expected to contribute around three-quarters of the rise in emissions from oil use, notably due to increases in international air travel. However, the aviation sector's emissions are still only around 80% of their pre-pandemic levels.

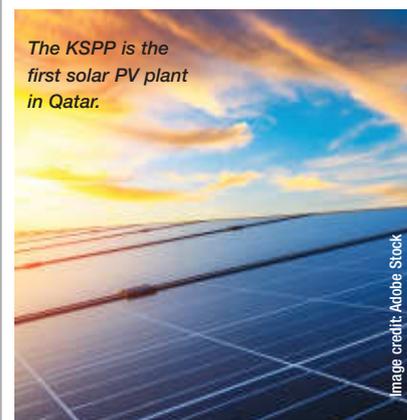
Uncertainty in global natural gas markets will continue to shape many key energy trends for the rest of this year and in 2023, says the IEA. However, promising signs of lasting structural changes to the CO<sub>2</sub> intensity of global energy are evident in 2022 – and they are set to be reinforced by major increases in government support for clean energy investment.



*The growth of renewables and EVs is holding down CO<sub>2</sub> emissions.*

## Qatar inaugurates its first solar PV power plant

HIS HIGHNESS SHEIKH Tamim bin Hamad Al Thani, Amir of the State of Qatar, has inaugurated the Al-Kharsaah Solar PV Power Plant (KSPP), the first in Qatar and one of the largest in the region, with a total capacity of 800 MW.



*The KSPP is the first solar PV plant in Qatar.*

The power plant has been developed and is operated by Siraj 1, which is jointly owned 40% by the Consortium formed by TotalEnergies (49%) and Marubeni (51%) and 60% by QatarEnergy Renewable Solutions. The project includes a 25-year Power Purchase Agreement between Siraj 1 and the power grid operator Kahramaa.

Located 80 km West of Doha, the plant was constructed over 10 sq km terrain. It can supply 10% of the country's peak power consumption and will avoid 26 million tons of CO<sub>2</sub> emissions during its lifetime.

"After our recent entry in the giant LNG projects NFE and NFS alongside QatarEnergy, we are proud to announce today the start-up of the Al Kharsaah solar plant. This giant project, which contributed to the sustainability roadmap of Qatar, demonstrates once again TotalEnergies' ability to support producing countries in their energy transition by combining natural gas production and solar energy to meet the growing demand for electricity," said Patrick Pouyanné, chairman and chief executive officer of TotalEnergies.

The inauguration follows QatarEnergy's recent announcement of a new solarisation project for the Ras Laffan and Mesaieed industrial cities, with the support of TotalEnergies. With 900 MWp of installed capacity, this project will be a second major milestone in QatarEnergy's strategy to reduce the carbon footprint of its facilities by 2030 and to develop 5 GW of renewable power generation capacity by 2035.

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## Energy crisis boosting momentum for hydrogen development - IEA

MOMENTUM CONTINUES TO build behind low-emissions hydrogen amid the global energy crisis, according to the International Energy Agency's (IEA) annual *Global Hydrogen Review*.

If all projects currently in the pipeline come to fruition, the production of low-emissions hydrogen globally could reach somewhere in the range of 16mn to 24mn tonnes per year by 2030 – up from just 1mn tonnes in 2021 – with more than half of it coming from electrolyzers running on renewable energy, the report finds. And promising pilot projects are proliferating for new applications of hydrogen in areas such as shipping and steel.

However, these promising uses for hydrogen remain relatively small within the wider hydrogen landscape and there is a need for greater policy support to help them grow. The majority of the hydrogen in use today is produced from fossil fuels without any technologies to capture the resulting CO<sub>2</sub> emissions. The report stresses that governments need to support development projects, but also take steps to reassure investors that there will be future demand for hydrogen.

The report indicated that the encouraging developments in hydrogen technologies that can support the clean energy transition include an expected sixfold increase by 2025 in global manufacturing capacity of electrolyzers, which are needed to produce low-emissions hydrogen from renewable electricity.

Meanwhile, overall hydrogen demand worldwide reached 94mn tonnes in 2021, exceeding the previous annual high of 91mn tonnes reached in 2019. Almost all of the increase last year was met by hydrogen produced from fossil fuels without carbon capture. And while demand for new applications of hydrogen jumped by 60% in 2021, the growth was from such a low base that it rose to just 40,000 tons.

With the global energy crisis boosting interest in low-emissions hydrogen, the pipeline of



Image Credit: Adobe Stock

Momentum continues to build for hydrogen development.

projects keeps expanding, although only a small share of the projects are under construction. The *Global Hydrogen Review* lays out a series of policy recommendations to build the frameworks and create the demand needed to encourage investment in low-emissions hydrogen, including in the electrolyzers and carbon capture technologies needed to produce it.

Taking into account today's policy settings by governments, the new report estimates that global hydrogen demand is set to reach 115mn tonnes by 2030. If governments fully deliver on their current climate pledges, that number could rise to 130mn tonnes, with more than a quarter of it being met by low-emissions hydrogen. A similar amount of global hydrogen demand would be for new applications in that scenario.

The report suggests that based on today's prices, renewable hydrogen could already compete with hydrogen from fossil fuels in regions that have good renewable resources and

that currently rely on imported fossil fuels for hydrogen production.

Today, global capacity to manufacture electrolyzers stands at 8GW a year, but based on industry announcements it could exceed 60GW a year by 2030. If electrolyzer projects in the pipeline are completed and the planned scaling up in manufacturing capacities takes place, costs could fall by around 70% by 2030.

IEA executive director, Fatih Birol, commented, "There are growing signs that hydrogen will be an important element of the transition to an affordable, secure and clean energy system, but there are still major advances in technology, regulation and demand needed for it to fulfil its potential. The strong flow of announcements we now see for low-emissions hydrogen projects are yet another indicator that a new energy economy is emerging. Governments now need to implement concrete policies to remove regulatory barriers and support shovel-ready projects."

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## ADNOC to hire two jack-up offshore rigs

ABU DHABI NATIONAL Oil Company (ADNOC) has awarded a contract worth US\$980mn to ADNOC Drilling to hire two jack-up offshore rigs and associated manpower and equipment. The contract, awarded by ADNOC Offshore, will support the expansion of ADNOC's production capacity as it responds to the growing global demand for lower carbon intensity oil and gas.



Image Credit: Adobe Stock

The contract is worth US\$980mn.

More than 80% of the award value will flow back into the UAE's economy under ADNOC's In-Country Value (ICV) programme, supporting local economic growth and diversification.

Yaser Saeed Almazrouei, ADNOC upstream executive director, said, "This award supports our ongoing efforts to responsibly unlock our lower carbon intensity oil and gas resources, alongside our strategic international partners, and contribute to global energy security. ADNOC Drilling's world-class capabilities continue to be a key enabler of these efforts. Importantly, this award will also deliver significant in-country value to drive economic growth and diversification, in line with the UAE leadership's wise directives."

## Uncertainty prevails over Turkey-Libya exploration deal

RECEP TAYYIP ERDOGAN, the President of Turkey, has signed a memorandum of understanding with Abdul Hamid Dbeibah, Prime Minister of the Tripoli-based Government of National Unity to explore the latter's oil and gas resources.

The deal also includes a provision whereby Libya's state-owned National Oil Corporation will allow Turkish upstream company Turkiye Petrolleri Anonim Ortakligi to participate in onshore and offshore projects in the North African country.

The agreement, however, stands on edge as the Tobruk-based House of Representatives refuses to recognise its validity. "Dbeibah has no right to sign deals with foreign powers," said Fathi Bashagha, who heads the Government of National Stability, appointed by the House of Representatives.

According to analysts, the current crude production of Libya stands at a recovered rate of around 1.1-1.2mn bpd.

## North Field South project to take in more partners

SAAD SHERIDA AL-KAABI, the Minister of State for Energy Affairs, and president and CEO of QatarEnergy, revealed that three new partners will be entering the North Field South (NFS) project in addition to TotalEnergies, adding that they will be announced in due course. He made the remarks during the Energy Intelligence Forum's Energy Executive of the Year Leadership Dialogue in London.



Image Credit: QatarEnergy

Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, and president and CEO of QatarEnergy. (Right)

Al-Kaabi noted that the North Field East, North Field South, and Golden Pass projects will bring a total of 48mn tons of LNG per annum, stressing that Qatar alone will bring most of the new LNG volumes between 2025 and 2027.



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"This certification is the latest addition to a growing library of international standards we are adopting and complying with in order to allow our customers the freedom to choose the very best industrial automation solutions. We look forward to engaging with more customers looking for future-proofed, platform-agnostic solutions across all industries," said Frank Janssens, vice president, KROHNE Middle East and Africa.



Image credit: KROHNE Group

**Frank Janssens, vice president, KROHNE Middle East and Africa.**

## Expro receives funding for carbon reduction projects

EXPRO, A LEADING provider of energy services, has been awarded funding for two carbon reduction projects as part of an innovation programme to accelerate clean energy production and close the gap in net zero technologies.

The Aberdeen-based Net Zero Technology Centre (NZTC) has awarded a total of £8mn (US\$9mn) to fund net zero technologies as part of their 2022 Open Innovation Program. The 20 winning technologies fall into seven focus areas. The technologies faced a rigorous selection process, ensuring each supports the transition towards net zero, with an obligation of trialling and deploying the technology within the UK Continental Shelf.

Expro secured both projects awarded in the Venting and Flaring category. They focus on real-time flare emissions measurement and control; and a unique technological solution to enable well testing to be conducted without the need for flaring. Both projects build on the company's existing capabilities to promote more measured and efficient means of flaring, and to offer alternatives to traditional flaring, in support of operators' carbon-reducing commitments.

The NZTC believes the 20 successful technology projects will deliver £7.8bn (US\$8.7bn) Gross Value Added along with an impact of 3.1Mt CO<sub>2</sub>e annually.

Expro's chief technology officer Steve Russell said, "We are delighted to receive the recognition and funding in this programme to help further develop these technological solutions that will play a part in accelerating the industry's journey to net zero.

"Technology is a critical component in energy transition progression, as are collaboration and partnership to achieve our collective goals. We are committed to addressing our own and the industry's effects on the planet, and this includes working with clients around the world to develop and implement solutions to reduce emissions from non-essential flaring."

In the Middle East, Expro recently supported a customer to reduce gas flaring and optimise production at 10 production sites. Expro undertook a detailed study to find an economic alternative to flaring. The solution was to use gas to power compressors, which were delivered, installed, and commissioned within 32 weeks. The fast-track project was estimated to reduce greenhouse gas (GHG) emissions by up to 10,000 tonnes of CO<sub>2</sub>e per day. Using the compressors also reduced operational expenditure while optimising production and extending field life.



Image credit: Adobe Stock

*Expro has been awarded funding for projects relating to venting and flaring.*

## MoU to enhance cyber security

THE ABU DHABI Department of Energy (DoE) has signed a Memorandum of Understanding (MoU) with the Cyber Security Council, aimed at enhancing the security of the UAE's energy sector. The MoU aims to align the efforts of the DoE and the Cyber Security Council as they develop and disseminate innovative technologies that enhance the digital and cyber security capabilities of the energy sector in Abu Dhabi. Both parties will exchange expertise and data in fields related to information and communication technologies, cyber security risks, electronic espionage, hacking, cyber-terrorism, and disinformation campaigns, among others, which are increasing in pace with the accelerated adoption of modern technologies.



Image credit: Abu Dhabi Department of Energy

**The signing of the MoU.**

Both parties are committed to cooperating and implementing cyber security standards in the energy sector in Abu Dhabi, in addition to developing national capabilities to deter and prevent cyber-attacks and provide immediate response when a government facility is exposed to such attacks or hacking attempts.

The MoU includes information sharing about the spread of malware and promising solutions in the field of information security, as well as participation in awareness building, educational programmes and scientific research.

His Excellency Eng. Ahmed Mohammed Al Rumaithi, Undersecretary of the Department of Energy in Abu Dhabi, said, "Information and communication technology is one of the key pillars of social and economic development in any country. However, with the acceleration of technological developments, digital attacks are becoming more diversified and vicious, posing serious threats to individuals and institutions. Therefore, we must work to ward off these risks in the digital space, and protect all sectors and industries, including the energy sector."



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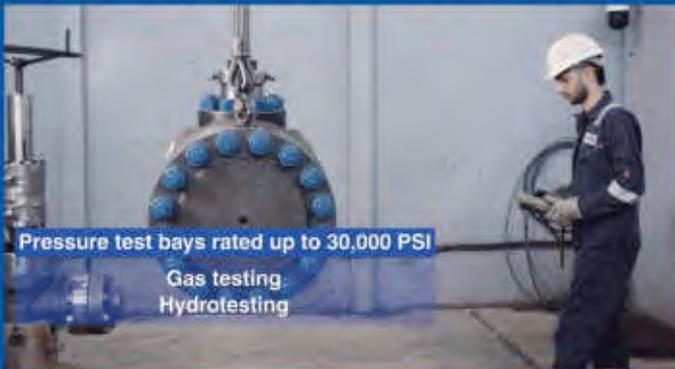
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## Oxford Flow partners with KKI

OXFORD FLOW, A flow control solutions specialist, and KOSO Kent Introl (KKI), part of Nihon Koso group, have entered into a strategic global partnership. The relationship will combine Oxford Flow's innovative valve technology with KKI's industry knowledge and valve heritage.

The partnership provides valve users across the global energy landscape access to industry-leading solutions that will not only support their journey towards more reliable, leak-free operations, but also future proof systems, with the drive to increase the use of alternative fuels.

Oxford Flow has engineered a portfolio of valves with only one moving part, to eliminate waste from valves for oil and gas, gas transmission and distribution, water and other industrial process applications.

Neil Poxon, Oxford Flow CEO, said, "We're delighted to have partnered with KOSO Kent Introl – and this truly is a unique partnership that will disrupt the valve market towards a more sustainable future. Combining our hydrogen-ready gas regulators and emissions-eliminating axial valve with KKI's industry knowledge, valve heritage and manufacturing expertise offers a very exciting prospect for both companies."



Image credit: Oxford Flow

Neil Poxon, CEO Oxford Flow.

## Partnership launched for NAS technology

SCHLUMBERGER HAS ENTERED into an agreement with RTI International, a nonprofit research institute, to accelerate the industrialisation and scale-up of its proprietary non-aqueous solvent (NAS) technology, which enhances the efficiency of absorption-based carbon capture. The NAS technology will be applicable to capture CO<sub>2</sub> across a broad variety of industrial emissions.

"With the world's carbon budget running out, reducing emissions is a societal imperative," said Gavin Rennick, president of Schlumberger's New Energy business. "Carbon capture technologies are a key enabler in realising a low carbon future – and we are excited about this exclusive agreement to work with RTI on industrialising and scaling this innovative carbon absorption technology, and bringing it to market."

The NAS technology offers a cost-effective alternative to conventional aqueous solvent technologies for carbon capture, as it consumes less energy while retaining high CO<sub>2</sub> capacity. The NAS technology is also less corrosive, eliminating the need for high-grade corrosion-resistant alloys and the associated increase in capital costs.

## AMPO POYAM VALVES opens new facility in Saudi Arabia

AMPO POYAM VALVES, a world leader in highly engineered valves, has celebrated the official opening ceremony of its new valve manufacturing and servicing plant, AMPO ARABIA, in Dammam 2nd Industrial City.

The manufacturing and servicing facility will be an extension of the main valve manufacturing plant in Spain and will include valve assembly, testing, painting and servicing facilities. The company intends to transfer global top-tier technology and know-how to the Saudi market, helping expand national industry capacity and enabling economic growth and development in the region, in line with Saudi Arabia's Vision 2030 and In-Kingdom Total Value Add (IKTVA). The facility will positively impact local delivery lead times and aftersales services to meet demands of current and future projects.

Ibon Imaz, AMPO's managing director, said, "We want to be a strategic partner and we share the Kingdom of Saudi Arabia's Vision 2030, an important country project. AMPO Arabia is just a start, and will be followed by further business opportunities and investments that can add higher value to the Saudi thriving economy." He added, "However, we are not new in Saudi Arabia. AMPO POYAM VALVES has been collaborating with the country customers since 1998, supplying more than 20,000 valves for strategic projects in KSA, such as Jubail, Yanbu, Ras Tanura, Rabigh, Khursaniyah, Marjan Field Expansion, Berri Field Development and Abqaiq project."



Image credit: AMPO POYAM VALVES

The ribbon-cutting ceremony.

## NNPC opens new yard

NATIONAL PETROLEUM CONSTRUCTION Company (NPCC), a subsidiary of National Marine Dredging Company, has hosted a groundbreaking ceremony for a new 400,000 sq. m fabrication yard in Ras Al Khair port, Saudi Arabia's newest industrial port, located in the Eastern Province of Saudi Arabia. The ceremony was attended by senior representatives from NMDC Group, Saudi Aramco and Saudi Ports Authority Mawani.



Image credit: NNPC

The ground-breaking ceremony.

The new yard, which will house the fabrication of jackets and platforms, is a state-of-the-art facility that will include automated workshops and an advanced marine system. It will provide fabrication, maintenance, rigging and erection services, and will be operational between all three phases of construction.

The first phase will be completed by the end of the third quarter of 2023. The capacity of the fabrication yard is expected to reach 60,000 tons per year by the end of the final phase, scheduled for 2026.

The project is in line with the company's commitment to supporting the Kingdom's localisation efforts and creating in-country value.

Eng. Yasser Zaghoul, the group chief executive officer at National Marine Dredging Group, said, "The new fabrication yard builds on our longstanding relationship, ongoing growth journey and expansion strategy in the Kingdom and complements our current projects in Saudi Arabia, which will add to our local competencies. We look forward to further broadening our level of collaboration with Saudi industry players and solidifying our position as the EPC major of choice for global NOCs."

NNPC has worked on major projects including the extension works for a new condensate export terminal at the Jafurah field, and the engineering, procurement, fabrication, and installation of 14 SSS Jackets at Manifa field. Earlier in 2022, NPCC won two sizeable offshore contracts for the multi-billion Zuluf incremental project.



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# ADNOC: a safe pair of hands in changing times

Abu Dhabi's state energy giant will play a pivotal role in the global energy transition, nurturing clean and sustainable technologies alongside the backbone of its traditional hydrocarbons output. Martin Clark reports.

**A**DNOC, THE ABU DHABI National Oil Company, continues to push hard as it expands and grows the UAE's energy profile far and wide. The state-owned energy group, which has multiple subsidiaries, is already estimated to be the world's 12th largest oil company by production – not bad for a country of just 10 million people.

Its oil production capacity in 2021 exceeded four million bpd, though there are plans to grow this to five million by 2030, underlining confidence in future market demand. There is no doubt ADNOC has a big role to play as the world's energy future shifts and is redefined by alternative energy sources and renewables. Like other Gulf states, the UAE will underpin demand during this transitional, uncertain time.

While carbon capture and other green initiatives form a major part of the group's present-day strategy, it is still a leading light in providing the essential fossil fuels required to keep the world's economy ticking.

Dr. Sultan Ahmed Al Jaber, ADNOC's managing director and CEO, as well as the UAE's Minister of Industry and Advanced Technology, told a conference recently that his nation wants to work on a pragmatic, realistic plan for energy transition and decarbonising, while investing in the new cleaner energies of tomorrow.

"Yes, we must all commit to mitigating the impact of global energy supplies, but let's keep our focus on capturing carbon – not cancelling production," he told the Energy Intelligence Forum in London during early October. "Let's hold back emissions, not progress."

“Let's hold back emissions, not progress.”



ADNOC Drilling has won major contracts to expand oil and gas production.

Image Credit: ADNOC

## Vital role in energy transition

With COP27, the key climate change summit in Sharm el-Sheikh, Egypt, just around the corner, the UAE is set to host the follow-up event, COP28 in late 2023. It underscores the UAE's role in championing alternative energy sources, alongside its traditional oil and gas extraction industry.

In 2009, Abu Dhabi was named as the world headquarters for the newly-formed International Renewable Energy Agency. In the meantime, ADNOC is investing in greater production capacity of its signature crude, Murban – which has half the carbon intensity of the industry average – and tripling its liquefied natural gas (LNG) capacity to more than 15 million tonnes per annum (mtpa). This trade will be supported by a 9.6mtpa LNG production and shipping terminal in the

Emirate of Fujairah, a location which avoids transiting the narrow and congested Strait of Hormuz.

Yet, there is a clear and obvious attempt to embed clean technology throughout the energy chain. ADNOC is using advanced technologies and renewable solar and nuclear energy to reduce the carbon intensity of its oil and gas output by a further 25% by the end of the decade, for instance.

Milestones so far include the implementation of a zero routine gas flaring policy in the early 2000s and establishing the region's first commercial-scale carbon capture and underground storage (CCS) facility in 2016. Looking ahead, it is also putting in place the building blocks to encourage hydrogen take up, as well as expanding the use of CCS systems.



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*ADNOC Refining's waste heat recovery project at Ruwais is vital to the ongoing expansion at Ruwais.*

Image Credit: ADNOC

### Decarbonising offshore

Much of its current project focus has been about utilising these and other ideas to decarbonise its vast oil and gas empire. It is a strategy that embraces multiple projects and ideas, as well as a good dose of inventiveness.

In a recent example, ADNOC and Abu Dhabi National Energy Company PJSC (TAQA) announced a US\$3.8bn strategic power project that will significantly decarbonise offshore production. Working with a consortium of Korea Electric Power, Kyushu Electric Power Company and Électricité de France, it marks the first-of-its-kind high-voltage direct current (HVDC) subsea transmission network in the MENA region.

The power consortium will build, own and operate the state-of-the-art transmission system for a period of 35 years, before returning it to ADNOC. It is expected to reduce the carbon footprint of ADNOC's offshore operations by more than 30%, replacing existing offshore gas turbine generators with more sustainable power sources available on the Abu Dhabi onshore power network, operated by TAQA's wholly owned subsidiary, Abu Dhabi Transmission and Despatch Company (TRANSCO).

The mega project also fits in with the UAE's broader 'Net Zero by 2050 Strategic Initiative'. Its vast scale reflects Abu Dhabi's mighty offshore production infrastructure. The transmission system will have a total installed capacity of 3.2GW and will comprise two independent subsea HVDC links and converter stations, with commercial operations set to begin in 2025. Up to 100% of ADNOC's grid power is being supplied by clean nuclear and solar energy.

### Upstream investment continues

At the same time, ADNOC continues to invest aggressively in its production capacity. It has just awarded a US\$1.53bn contract to a subsidiary, ADNOC Drilling, for offshore drilling work in support of its expansion plans. The two-year contract covers the provision of 12 jack-up rigs and two island rigs, as well as associated drilling services.

It is also a significant boost for local, in-country services – around 80% of the award value will flow back into the UAE's economy. Yaser Saeed Almazrouei, ADNOC upstream executive director, said the award will support the group's expansion of crude oil production to five million bpd by 2023, as well as build gas self-sufficiency for the country.

“ADNOC continues to invest aggressively in its production capacity.”

“Through this award, ADNOC Offshore will continue to responsibly harness the energy in Abu Dhabi's waters, as we increase production capacity to meet the world's growing demand for energy with lower carbon intensity oil and gas.”

Despite the current obsession with net zero, particularly in the West, demand for Abu Dhabi's oil and gas remains as great as ever, particularly from across the fast-growing Asia region, which still also burns huge amounts of coal for its power generation.

### Downstream efficiencies

Active across the whole energy chain, ADNOC is likewise making efforts to maximise its downstream production, while curbing negative environmental impacts.

ADNOC Refining, a joint venture with international energy companies, Eni and OMV, is soon to complete the first phase of its innovative waste heat recovery project at its General Utilities Plant in Ruwais.

The US\$600mn project, which was started in 2018, will recycle waste heat generated from the plant to produce up to an additional 230MW of electricity per day – enough to power hundreds of thousands of homes.

The project captures exhaust heat from the plant's gas-powered turbines – which is currently vented into the atmosphere – to produce steam that is subsequently used for power production. It will also produce 62,400 cu/m of distilled water per day for use across the facility.

Phase one of the project, which includes the operation of two new boilers and turbines, will be completed before the end of the year. Phase two, which includes a further two boilers, is expected to be completed around the middle of 2023.

Overall, the project will increase power production and thermal efficiency at the plant by around 30%, with no additional carbon dioxide emissions.

“The Waste Heat Recovery project will revolutionise power and water generation at our plant in Ruwais, and is vital to the ongoing expansion of Ruwais as part of ADNOC's 2030 smart growth strategy,” commented Abdulla Ateya Al Messabi, chief executive officer of ADNOC Refining. ■



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# Embracing the 21st century in HSE

The MENA HSE Forum 2022 examined the future of digitalisation in the HSE sector and how digital transformation is driving the industry. Fyna Ashwath reports.

**D**IGITAL TECHNOLOGY IS increasingly impacting health, safety, and the environment, contributing to greater competitiveness.

At the MENA HSE Forum, the impact of disruptive technologies and high speed communication to improve workplace safety, monitor employee health and build a sustainable workforce, was a focus of discussion.

By elaborating on the digitalisation journey of Petrofac, a leading provider of services to the global energy industry, Lynn Hobballah, the company's head of health and safety, highlighted how new technologies are playing an ever prominent role in the HSE activities of her organisation.

She explained that as the need for engaging and agile communication keeps growing, utilising technology can help leaders make informed decisions, revolutionise employee engagement and embrace modern training techniques that induce a positive safety culture and reduce incidents at worksites, creating a holistic culture of risk identification.

## Mobile technology – a game-changer

Technology provides vast solutions but it is important to understand what is relevant to the organisation. Hobballah outlined how mobile phone technology can offer a great means to reach out to the workforce and drive positive change. Emphasising the influence of this technology in our lives, she pointed out that recent studies indicate that the average time a person spends daily on the mobile phone is approximately three hours and fifteen minutes or more.

Petrofac realised that digital technology is the enabler to bring HSE to the forefront of people's minds and induce action by complementing it with conventional practices such as site management walk-throughs and safety meetings. Safety and health are of paramount importance at Petrofac, and its internal safety campaign, Horizon Zero, aims for zero safety incidents by promoting personal commitment and competence



Image Credit : Alain Charfes Publishing

*Lynn Hobballah, the company's head of health and safety, highlighted how new technologies are playing an ever prominent role in the HSE activities of her organisation.*

throughout the organisation.

"In order to do this, Petrofac focuses on some pillars, two of which, Leadership and Employee Engagement, are central to an influential approach coupled with digital technology to drive positive change in preserving the culture of safety," said Hobballah.

For the Leadership, Petrofac realised the

need to reenergise their role, providing support for improved visibility and accountability.

"To provide the leadership with real-time visibility of safety performance, we developed the Digital Safety Boardroom, which, through one click from the mobile phone, provides access to data for every site location. Acting as a single source of truth, it helps in providing insights into where to focus the attention of the management and invest their resources, for instance by concentrating on the root causes of accidents."

Although it seems simple, Hobballah was quick to point out that the organisation had to overcome a number of challenges.

"The first one was the availability of data. It was difficult to project the wealth of data available across the organisation into the dashboard, so we realised the need for data management systems. "The second challenge was data consistency, and it pushed us to develop data governance procedures which

“ Digital technology is the enabler to bring HSE to the forefront of people’s minds and induce action by complementing it with conventional practices.”



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are really important for organisations adopting this method. And the third was deciding what to reflect on the dashboard because every stakeholder has different interests, for example, the set of KPIs for the operations team will differ from those of the construction team. So, we finally conducted a global HSE roadmap workshop including all stakeholders and came up with one dashboard,” Hobballah explained.

As part of its HSE strategy, the organisation made use of several apps to increase situational awareness of the employees and increase their level of communication as well as team work.

“For greater employee engagement, any technique needs to be relevant to the worker, making it a personal responsibility and more accessible,” added Hobballah.

“One of the methods that Petrofac uses to increase employee engagement is the Observation App for HSE, to report safe, positive observations via mobile devices. The second is the Driving Improvement App, embedding a culture of personal responsibility over policing in all drivers within the organisation to see where they rank against their colleagues, promoting friendly competition, thus building in behavioural change to improve performance,” she explained.

Another example that Hobballah cited, which Petrofac used for bringing health and safety to the forefront, is Yammer, made popular in the organisation by launching competitions, safety discussions and other methods. It was well embraced and has now become a tool for sharing lessons learned, showcasing best practices, asking questions or requesting support from other worksites, thus helping to break silos. Hobballah revealed that the app is now viewed by more than 3800 employees globally, within the organisation.

Another digital tool, The Safety Hotspot, is a hands-on training facility based at the worksites and focusing on life saving rules. While effective, it has limitations such as space availability. So, Petrofac has complemented these with training methods using the digital experience through the increased emphasis on e-learning to provide a number of training courses. Hobballah added that Petrofac is exploring the possibilities of virtual reality for more effective training.

The presentation on Petrofac’s digital journey offers great learning for organisations intending to introduce such innovative tools. Hobballah revealed that after embracing digital technology, Petrofac has witnessed

“For greater employee engagement, any technique needs to be relevant to the worker, making it a personal responsibility and more accessible.”

greater involvement, commitment and number of observations on health and safety, across the organisation.

“Before embarking on this, we should define the strategy through a vision such as meeting sustainability targets or greater efficiency, then understand where we are by conducting an internal review, define where we want to be, and finally define the projects to work on,” summed up Hobballah.

“Although nothing will replace physical presence and conventional practices, Health and Safety in the 21st century demands a 21st century approach,” she concluded. ■

Image Credit : Adobe Stock



*Before embarking on the digital journey, it is important for an organisation to define its strategy, understand where it is and wants to be, and then define projects to work on.*

# Boosting climate ambitions with flow control technology

Jonathan Abbott, chief technology officer at Tendeka, explains how novel completion technologies can fast-track the industry's journey towards net zero.



Jonathan Abbott, chief technology officer, Tendeka.

**The oil and gas industry is galvanising efforts to reduce carbon emissions and reach net zero goals. What technologies can Tendeka offer in this regard?**

Ensuring reliable, fit-for-purpose and sustainable completion solutions remains a significant challenge facing the industry. Tendeka has developed and deployed a specialised range of inflow control solutions which target optimum flow performance. These effectively manage the production of excessive, unwanted water and gas, without the need for costly treatment or reinjection at the surface. Our extensive research and experience has improved productivity and profitability for operators across the globe while cutting emissions and reducing risk.

In line with our vision "to optimise every drop of energy produced from the planet", we strive to help our clients in reducing their carbon footprint through use of technologies that support a low carbon economy. In accordance with international and national sustainability targets, we are actively reducing our own carbon footprint and aim to achieve net zero CO<sub>2</sub> emissions by 2025.

**As a production optimisation specialist, can greater reservoir recovery be achieved in a safer and more sustainable way?**

Our portfolio of passive and autonomous inflow and outflow control devices (AICDs and AOCDs), for example, enable operators to minimise the production of unwanted fluids and keep them in the ground whilst still producing oil. They are fully interchangeable, field-adjustable and integrated into the lower completion either with sand screens, or within short subs for non-sanding applications. They

are suitable for multiple applications in injection and production wells, as well as different types of reservoirs.

To illustrate the significant impact of these innovative devices, we used a workflow methodology and a publicly available GHG footprint estimator on two typical, high viscosity oil fields where wells usually operate at high water cut up to 99%, leaving significant amounts of oil behind. The study confirmed that the deployment of autonomous technology could safely and sustainably reduce the energy consumption and GHG emissions during production and surface processing. From exploration to production, this verdict empowers operators to optimise efforts to deploy technologies, methods and/or workflows which can truly reinforce net zero ambitions.

**Innovation and technology are fundamental to Tendeka's DNA. How can the company's insight and ingenuity support carbon capture and storage (CCS) efforts, for example?**

CCS is a vital technology in the battle against climate change, and depleted oil and gas fields are prime targets for CO<sub>2</sub> sequestration. Tendeka has developed a CCS simulator which can model the process of CO<sub>2</sub> injection into multi-layered reservoir. This simulator evaluates the performance of a range of flow control and advanced completion technology for improving the efficacy and efficiency of CO<sub>2</sub> injection.

Flow control technology can be installed as part of a well completion to create an additional pressure drop to balance distribution and the CO<sub>2</sub> injection rate. Our

advanced completion technology, PulseEight, is the world's first re-deployable wireless completion with control, power, monitoring and communications already on board. This technology can be applied to manage the phase behaviour of CO<sub>2</sub> during the life of the well avoiding the need for costly recompletion.

The CCS injection simulator is proven to effectively model the reliability and feasibility of using downhole flow control devices over varying envelopes of injection and pressure scenarios to safely secure and store liquid CO<sub>2</sub> long-term. The results support cost-effective alternatives to recompletion or intervention over the life of the well.

**What recent projects showcase Tendeka's reliability and success as a technology provider?**

Tendeka has worked with Equinor for more than a decade and recently signed a new multi-year contract extension to exclusively deliver standardised sand-face completion equipment across all the operator's NCS assets. It's recognition of our drive for innovation, as well as both teams' joint approach to implementing sustainability measures to improve logistics, reduce waste and lead to shorter lead times.

In the Middle East, our AOCD technology was recently installed as a retrofit solution in an injection well in a carbonate reservoir. Proven to reduce injection cost, improve field NPV, ensure reliability of injection well systems, and control conformance and manage uncertainties, the technology significantly improved the overall sweep efficiency. ■

# Can Iraq unlock its untapped oil & gas resources?

Moin Siddiqi, economist, discusses whether Iraq can finally unlock its phenomenal hydrocarbons resources, with the potential to double production.

**T**HE PETROLEUM SECTOR is the lifeline of Iraq, contributing around 65% and 90%, respectively, of the country's gross domestic product (GDP) and income. Despite some progress over the past decade, considerable work is required to transform Iraq into an oil-power state. The country is home to some of the largest (undiscovered) oil and gas resources on earth.

Iraq owns seven 'supergiant' fields (more than 5bn bbl) plus several 'giant' fields (more than 1bn bbl), mostly in the south. Around four fifths of recoverable reserves are in the Basra region, while one fifth is in northern Iraq, including the areas of Kirkuk, Irbil, and Mosul. The oilfields, which are either in production or development stages are in relatively unpopulated areas with flat terrain and proximity to coastal ports (Basra, Khor al-Amaya, and Khor al-Zubair), with low extraction costs thanks to uncomplicated geology. Oil output has risen since 2010 despite infrastructure bottlenecks, supply disruptions in the north, budget constraints, which resulted in lower spending plans and reduced payments to international oil companies (IOCs), and contractual delays.

BP's proved oil reserves data (145bn barrels) derived from the U.S. Geological Survey (USGS) 2000 assessment is outdated. The International Energy Agency (IEA) reckons Iraq is significantly 'under-explored' since only 113 of the 530 potential oil-bearing structures identified by geophysical means in Iraq as of 2012 were drilled, with oil deposits confirmed in 73 of them. Iraq has long boosted an impressive exploration success rate. Hence, the probability of future discoveries is strong, given the application of advanced exploration and production (E&P) technologies, such as 3D seismic surveys, horizontal drilling and Geostream data for detecting untapped resources in some remote acreage.

## Undeveloped oil frontier

Iraq's 'ultimately recoverable resources' in 2012 were estimated by the IEA at 232bn barrels. As of end-2011, only 35bn barrels of

### Iraq's proved hydrocarbons reserves

	End-2000	End-2010	End-2020	R/P ratio/
Crude oil (billion barrels)	112.5	115.0	145.0	96.3
As % of Middle East* total	16.1	15.0	17.3	82.6
World total	8.6	7.0	8.3	53.5
Natural gas (trillion cubic metres)	3.0	3.0	3.5	336.3
As % of Middle East* total	5.1	3.8	4.6	110.4

*\*Excl. Algeria, Egypt & Libya, which come under North Africa region./Reserves-to-production ratio, measured by years of E&P activity.*

*Source: BP Statistical Review of World Energy June 2021.*

*Iraq holds the world's fifth biggest petroleum reserves after Venezuela, Saudi Arabia, Canada and Iran. Excl. Canadian oil sands (161.4bn barrels) & Venezuelan tar sands (261.8bn barrels), Iraq possesses third-largest reserves of conventional oils after Saudi Arabia (297.5bn barrels) & Iran (157.8bn barrels), respectively.*

[that] data was produced. Other sources put undiscovered (probable) resources even higher, which included the semi-autonomous region of Kurdistan. Iraq is sitting on potential (untapped) reserves of 100bn barrels according to energy analysts IHS Markit, which if 'fully exploited' could see Iraq overtaking Saudi Arabia as No.1 oil producer, it said. Iraq's Oil Ministry put undiscovered resources at 215bn barrels (2013). But a major improvement in security and investment is needed.

“The country is home to some of the largest oil and gas resources on earth.”

Even using the most conservative IEA data, Iraq back in 2012/13 had produced only 15% of its ultimately recoverable oil resources, compared with 23% average for the Middle East region. Further exploration activities were “highly likely to add substantially to the proven reserves figure over the coming decades, particularly given the high success rate of drilled prospects in Iraq.” (IEA 2013). Undoubtedly, Iraq ranks among the world's most underdeveloped oil frontiers, hence

offering myriad opportunities for risk-tolerant IOCs.

## Middle-term targets

The Oil Ministry plans raising total crude oil production to 7mn bpd by end-2027; this would require an output expansion of 2.47mn bpd from the August 2022 level. Iraq's sustainable productive capacity should increase over coming years, underpinned by an expansion of the southern fields, notably Rumaila, West Qurna, Zubair, Gharraf and Majnoon. Achieving plateau production of 2.82mn bpd for West Qurna-1 and 1.8mn bpd (West Qurna-2) is crucial to ambitious goals. Located around 65 km northwest of southern port of Basra, both supergiant fields with roughly 21.6bn of reserves in place can produce far excess of their combined output of 850,000 bpd.

The Rumaila field (discovered in 1953) with remaining recoverable reserves of 17bn barrels has a plateau target of 2.1mn bpd compared to current capacity of 1.4-1.5mn bpd. Iraq also plans to optimise output at the giant Zubair field (operated by Eni), which is due to benefit from the construction of a 380-megawatt power plant. The initial target is 600,000 bpd; however, longer-term capacity could hit 1.2mn bpd.

A high oil price has promoted Iraq to 'fast-track' development of some technically

challenging giant fields in the ThiQar province, notably Nasiriya and Gharraf with estimated oil-in-place of 4.36bn and 1bn+ bbl, respectively. The Western Desert and Nineveh Governorate (least explored) regions could also see “remarkable activity” in the exploration sector, according to Iraqi Oil Exploration Co.

“E&P activity has remained sluggish, with output rising from 3mn bpd in 2012 to 4.1mn bpd in 2021.”

Are Iraq's production goals realistic? In broad terms, yes, based on proved and unproved reserves, plus surplus capacity compared to other major producers. Hellenic Shipping News Worldwide (May 2022), noted “whilst many members of the OPEC+ group are struggling to achieve its allotted output quota, one country that has been able to is Iraq”.

### Iraq's net oil-export revenues, (US\$ bn)

	Projections			
	2020	2021	2022	2023
	48	83	131	120
As % of OPEC total	15.0	14.5	14.4	14.3
Spot crude price* (US\$ per barrel)	41.69	70.89	102.09	94.58

\*Brent blend (global benchmark).

Source: U.S. Energy information Administration, August & October 2022.

**Iraq is the Middle East and OPEC's second largest producer after Saudi Arabia. It exports four grades of crude oil: Basra Heavy; Basra Medium; Basra Light; & Kirkuk. Over 70% of oil production is concentrated in Basra Governorate, and remainder from northern & central fields, near Kirkuk.**

**The largest importers of Iraqi oil are China, India, South Korea, the U.S. & Italy.**

### Deterrents to plateau output targets

However, E&P activity has remained sluggish, with output rising from 3mn bpd in 2012 to 4.1mn bpd in 2021 – equivalent to an annual hike of 102,000 bpd over a decade. In absolute terms, it represented a poor return on a massive reserve base and particularly when factoring the cheap ‘lifting cost’ (US\$2-3 per barrel) at most Iraqi oilfields – the world's lowest on par with Saudi Arabia and Iran.

So why is Iraq struggling to reach its optimal potential? The answer lies in a host of factors, chiefly infrastructure bottlenecks, power and water shortages in some oilfields, low government funding for E&P plans, sectarianist conflict and poor governance. The investment climate poses challenges of attracting higher upstream investment into maturing oilfields. IOCs operate under technical service contracts (TSCs); however, terms of new contracts are not sufficiently



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Another risk for foreign operators is continued political instability, as highlighted by Hellenic Shipping News (May 2022): “While the Iraqi data suggest a positive production outlook, it will still have to ensure the national stability required to make its plans a reality, one should also exercise caution moving forwards.” The IEA echoed: “The long list of above-ground obstacles in Iraq – political gridlock, security challenges, attracting foreign capital and water scarcity – will be very challenging to overcome, and the assumed increases cannot be taken for granted.”

After decades of conflict, Iraq is “badly in need of foreign investment, and specifically investment in energy sector infrastructure,” said the Middle East Institute in Washington. Related infrastructure, including pipelines, transport routes, storage tanks, piping, atmosphere flares and other ancillary services are not on levels with core Gulf producers (Saudi Arabia, the UAE and Kuwait). Although oilfields boast the capacity to pump more than 5mn bpd, poor storage and export facilities prevent Iraq from meeting this output level. The main Basra Oil Terminal has undergone upgrades, bringing operational capacity to 3.45mn bpd. To facilitate any future hikes in production and exports, it requires boosting the export capacity of Southern Iraq’s deep-water ports.

There is scope to increase output from key southern fields by end-2027; however, a more realistic mid-term target for capacity expansion is 6mn bpd.

### Water injection key to future production

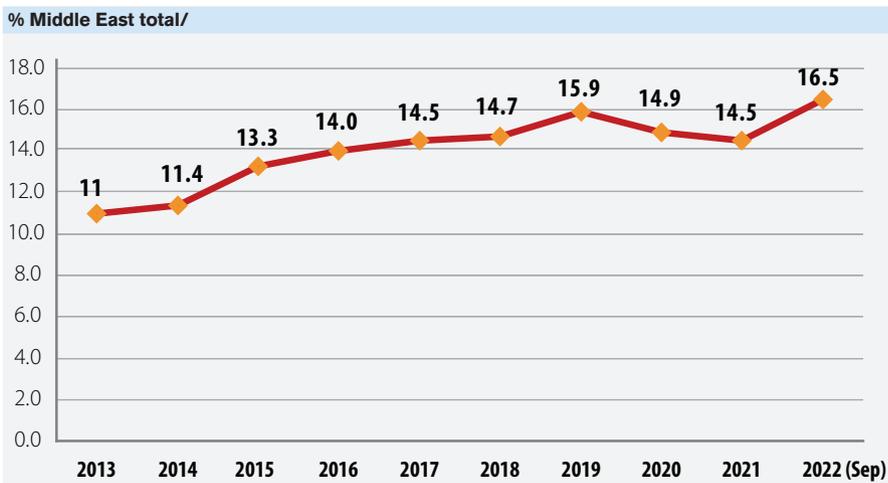
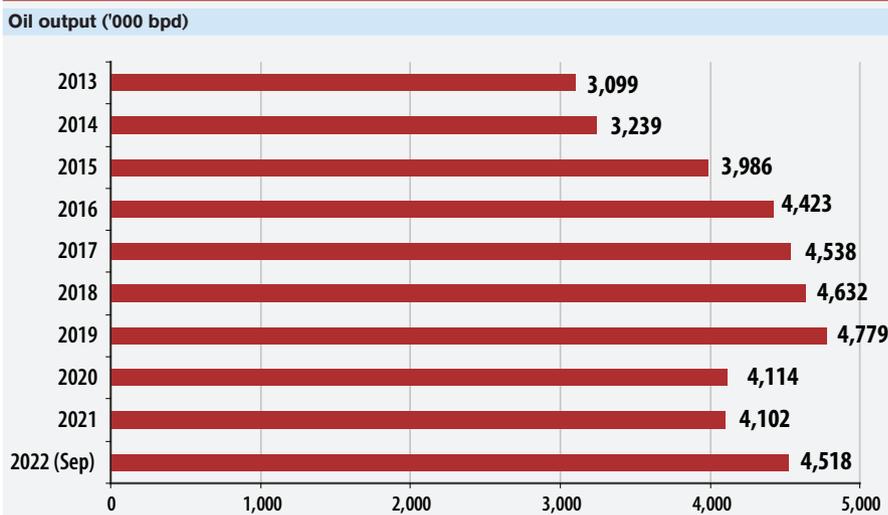
To boost the pressure at mature oilfields (Rattawi, Zubair, West Qurna-2, Majnoon, and Rumaila), plus counter declining output yields, the Common Seawater Supply Project (CSSP) was unveiled in 2011, with estimated US\$10bn cost. Around 80% of productive fields have an ultimate recovery factor of 15-40% (Iraq Energy Institute data).

The [interminably-delayed] CSSP entails utilising 12.5mn bpd of reprocessed seawater from the Persian Gulf and then transporting it via pipelines to oil production facilities for water injection to raise reservoir pressure, thereby optimising the longevity and output of fields. Generally, southern oilfields require 1.3- to-1.5 barrels of water injection to produce 1 barrel of oil.

The completion of CSSP is crucial in enabling Iraq to reach 2027 goals of 7mn

“ A more realistic mid-term target is 6mn bpd.”

### Ten-year trends in Iraq's crude oil production\*



\*Incl. condensate & natural gas liquids; /Excl. Algeria & Libya.  
Sources: BP Statistical Review of World Energy June 2022 & OPEC Oil Market Report October 2022.

bpd, but it faces considerable financial and logistical obstacles. To attain and hold future oil production targets over an extended period, Iraq needs total water injection equivalent to about 2% of the combined average flows of the Tigris and Euphrates rivers, according to the IEA.

### EOR applications

The future of hydrocarbons recovery and production in Iraq also depends on sophisticated technologies to extract oil from ‘probable’ or ‘possible’ reserves. The former has a probability of 50% recovery and the latter an intended probability of 5-10%. Whereas Iraq’s proved reserves generally have 90-95% certainty of containing the amount specified.

There are three major categories of enhanced oil recovery (EOR) applications, each of which has varying implications on cost, efficiency, and safety:

\*Thermal recovery, which involves the

introduction of heat such as injecting steam to lower the viscosity, or thin, the heavy viscous oil, thus improve its ability to flow through the reservoir.

\*Gas injection, which uses natural gas, nitrogen, or carbon dioxide (CO<sub>2</sub>) that expands in a reservoir to push additional oil to a production wellbore, or other gases that dissolve in the oil to lower its viscosity, thus improving its flow rate.

\*Chemical injection, which involves the use of long-chained molecules called polymers to increase the effectiveness of waterfloods, or using detergent-like surfactants to help lower surface tension that often prevents oil droplets from moving through a reservoir.

Higher oil prices make extraction of expensive crude in different reservoirs economically more viable. EOR is a more capital-intensive process to increase ‘cumulative oil produced’ (mainly from matured-ageing wells), when conventional techniques are obsolete.

## Long neglected stranded assets

Compared to petroleum, the natural gas sector remains severely under-exploited, despite Iraq holding the globe's 13th biggest proved reserves of 3.5 trillion cubic metres (Tcm) as of end-2020 (BP data). Unofficially, the figures are much higher. The IEA estimated Iraq's 'ultimately recoverable resources' at 8.0 Tcm. Around 75% of total reserves comprise associated gas (i.e., found in the same reservoirs as oil). Non-associated and salt 'dome' gas made up the rest. Therefore, future oil E&P projects will also directly affect the upstream gas sector.

This huge potential over decades has been simply flared off, reflecting the lack of infrastructure to utilise gas for power generation and other industrial usages. As per BP 2021 data, Iraq ranked the third worst country for flaring associated gas (17.7bn cm), after Russia (26.4bn cm) and Iran (18.5bn cm). Iraq's 2021 gas output was negligible at 9.4bn cm, whereas the UK and Uzbekistan with tiny reserves of 0.2 Tcm and 0.8 Tcm, respectively, produced 32.7bn cm and 50.9bn cm in 2021.

“ The natural gas sector remains severely under-exploited.”

Iraq boasts the capacity to monetise untapped gas resources by building facilities for liquefied natural gas; distillates; liquefied petroleum gas; compressed and semi-cooled liquefied gas. There is also scope for downstream activities, such as iron, steel and aluminium smelting and developing the petrochemicals sector, as well as gas reinjection for EOR programmes.

Successfully capturing associated gas rather than flaring it will help reduce high emissions and more important revive the long-stalled Royal Dutch Shell's US\$11bn Nebras petrochemicals venture, which could be online within five years and would yield massive windfalls of US\$100bn for Iraq over a 35-year initial contract period. However, without adequate infrastructure for capture and processing, the country's gas reserves will be wasted, hence lost 'opportunity cost' (i.e., forgone benefit) that would have been derived from developing a gas-based downstream industry.



Image Credit : Adobe Stock

Much of Iraq's associated gas is wasted through flaring.

Iraq's strategic role in oil markets is crucial for global energy security. Increased output could halt the rapid surge in oil prices at a time when the global economy is slowing down. Iraq could in the near-term help western countries to reduce dependency on Russian oil by achieving higher production targets. It is well positioned to take advantage of the European Union (EU) embargo on Russian seaborne oil imports by end-2022.

In sum, Iraq's oil reserves are significantly untapped, and daily production (given large investments in energy infrastructure and civil stability) could be doubled within 10 years, thereby making it a bigger global player in the oil industry. ■

## Iraq's oil and gas fields

**'Supergiant' onshore oilfields:** Majnoon (estimated reserves 12-30bn barrels); South & North Rumaila (17bn barrels); West Qurna-1 (12.9bn barrels); East Baghdad (11bn barrels); Kirkuk (10bn barrels); West Qurna-2 (8.7bn barrels); and Nahr-Umr (6bn barrels).

**'Giant' oilfields:** Halfaya (4.6bn barrels); Zubair (4bn barrels); Rattawi 3.1bn barrels; Al-Nasiriyah (2.6bn barrels); Bai Hassan (2.3bn barrels); Suba-Luhais (2.2bn barrels); Tuba (1.5bn barrels) and Gharaf (1.1bn barrels).

**Main non-associated gasfields:** Al-Anfal; Chemchamal, Jaria Pika, Khashm Al-Ahmar and Mansuriya, located in northern Iraq.

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# Addressing energy security concerns

Middle East energy leaders highlighted the need for continued investment in oil and gas at the Energy Intelligence Forum held in London in October.



Image Credit : Adobe Stock

*The need for continued investment in oil and gas was underlined at the Energy Intelligence Forum.*

**E**NERGY SECURITY IS essential for social, economic and climate progress, and the responsibility of the energy industry in maintaining energy security has never been clearer, according to His Excellency Dr. Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology and managing director and group CEO of Abu Dhabi National Oil Company (ADNOC).

Speaking at the Energy Intelligence Forum in London in early October, H.E. Dr Al Jaber said market sentiment does not reflect the real underlying fundamentals, tight spare capacity and long term demand growth. Therefore, policies aimed at pulling the plug on the current energy system, before we have built the new one, are misguided. He added that for economic progress to be maintained, substantial investment is required in hydrocarbons, which the world will rely on well into the future.

"We have seen that all progress starts and ends with energy security. And, as the world's energy leaders, our responsibility in maintaining that energy security has never been more evident," H.E. Dr Al Jaber said.

"Yes, we must all commit to mitigating the impact of global energy supplies, but let's keep our focus on capturing carbon, not cancelling production. Let's hold back emissions, not progress."

H.E. Dr Al Jaber went on to explain that partnership with the energy sector is critical to

a successful energy transition. He noted that the energy transition represents the most complex, capital intensive project in human history and that no-one has more experience in delivering these kinds of projects than the energy industry.

"As COP27 approaches and the UAE prepares to host COP28, let's advocate for an inclusive approach that takes advantage of the expertise of the people in the oil and gas industry. For the energy transition to succeed, the energy professionals need to be in the room, as equal partners alongside all other stakeholders."

“When you erode that spare capacity, the world should be worried.”

H.E. Dr Al Jaber said the UAE is keen to work with partners to mitigate the impact of hydrocarbons on the climate and build on its expertise as a responsible and reliable regional leader in low and no carbon energy.

Speaking at the same event, the president and CEO of Saudi Aramco, Amin H. Nasser, also aired his concerns over the lack of global spare oil capacity. Nasser discussed how the market has its sights set on the short-term

economic factors rather than focusing on the longer-term supply factors.

"I think the market is focusing on short term economics," he said, "It is focusing on what will happen to demand if a recession happens in different parts of the world; it is not focused on supply fundamentals."

With global spare capacity sitting at approximately 1.5mn bpd, Nasser worries that once China's demand increases after they ease Covid-19 policies, the small buffer will be eroded away swiftly.

"If China opens up, the economy starts improving, or the aviation industry starts asking for more jet fuel, you will erode this spare capacity," Nasser said.

"When you erode that spare capacity, the world should be worried. There will be no space for any hiccup, any interruption, any unforeseen events anywhere around the world."

Currently, Aramco's capacity sits at 12mn bpd, with the target to increase to 13mn bpd by 2027.

Nasser commented that Aramco could reach capacity within 30 days if needed, but he stressed the importance of avoiding reaching that number.

"We should be really concerned if we reach that level, because it means you are running in the world with no spare capacity.

"You will have volatility, and prices will escalate so fast, this is what's happened with gas and LNG." ■

## Energy trilemma in focus at AIEN International Energy Summit

WITH THE ENERGY industry facing huge challenges to meet the world's future demands, the energy transition, along with energy security, affordability and sustainability, were hot topics at the 2022 AIEN International Energy Summit, which took place from 27-29 September in London.

In his closing remarks J. Scott Porter, 2022-2023 AIEN president; VP Acquisitions & Divestments and NBD - Shales, Deep Water & Global Exploration, Shell plc, reflected on the discussions and messages that had rung out throughout the event.

Porter said, "There has been tremendous energy at this year's Summit, and it is great to see people from all over the world once again face-to-face and deeply involved in panel discussions and networking opportunities."

He referred to the speech made by The Rt. Hon. Lord Robertson of Port Ellen KT, GCMG, honFRSE, PC, former NATO secretary general and UK defence secretary, who spoke about the global imperative of energy security and said, "We are living in the most perilous time of my generation. Issues have gone global, while politics have gone local – and that underpins so much of the challenges we see."

Panels at the summit covered exploration, Africa's energy future, energy transition and energy security and the role natural gas and hydrogen have to play. Other topics included carbon capture and storage, the future of financing for the energy industry and how the energy transition is affecting M&A strategy.

Porter referred to the African panel, which revealed some sobering facts: looking forward, 25-30% of the world's population will be in Africa, and 60% of that population will have no electricity. Participants encouraged a balanced and pragmatic approach to the energy transition in Africa, where 600mn people lack access to electricity and energy poverty is a critical issue.

Porter said, "Energy affordability will become more and more relevant, but energy security and the energy transition are also paramount.

"We have listened to discussions about how, of the world's total energy supply, 81% is fossil fuels, yet we have halved investment in these since 2014. We face multiple challenges – technical and political, but also around core economics. As one of our speakers said, 'Without energy security there is no energy transition, and without fossil fuels there is no energy security'.

"Many discussions have focused on the transferable technical and commercial skills within the traditional energy (oil and gas) industry. When we look at carbon capture as a technology or hydrogen as a new energy, for example, we need integration and integrated solutions. The technology is not new, the challenge is rolling it out at scale. Skills within the oil and gas industry can pull this off."

Other comments from the panel discussions revolved around timescales for energy transition and its 'long horizon'.

"Energy systems are complicated. Any effective transition is going to be complicated, and any end-state system is going to be complicated. The members of the AIEN have the experience needed to manage large, complicated projects; to allocate risks among partners, suppliers, customers and investors; and to design commercial solutions that will attract the funding we will need for the energy transition," continued Porter.

"We have a great purpose going forward to take us into the next energy system. We are a focused group of professionals at the leading edge of solving the problems of the energy industry. Together we will work out how to get where we need to be," he concluded.

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# Prospects for the energy transition

The heightened focus on energy security and the rising cost of energy are reinforcing the difference in decarbonisation speed between Europe and the rest of the world, according to DNV's recently released Energy Transition Outlook.

**E**UROPE WILL PRIORITISE renewables and energy efficiency to increase its energy independence. European gas consumption will fall dramatically as a result of the war in Ukraine. Compared to last year's forecast, DNV sees the continent consuming almost half the amount of natural gas in 2050.

Lower-income countries see a different trend, as cost mainly drives energy policy. High energy and food prices are reversing the coal-to-gas switch, thus putting a dampener on decarbonisation investments.

Moreover, inflationary pressures and supply chain disruption pose a slight challenge to renewable growth. DNV's Outlook states the global electric vehicle (EV) 'milestone' has been delayed by one year to 2033.

However, the devaluing of renewables and increased carbon costs in the longer term take precedence over the current crisis on the overall energy transition.

"The turbulence in the energy market does not dramatically alter the decarbonisation pathway towards mid-century," said Remi Eriksen, group president and CEO of DNV. "The strongest engine of the global energy transition is the rapidly reducing costs of solar and wind energy, which will outweigh the present short-term shocks to the energy system."

For the first time, DNV's forecast sees non-fossil energy account for more than 50% of the global energy mix by 2050, owing to the growing and greening of electricity production. Solar PV and wind are already the cheapest form of electricity in most locations, expecting to see substantial growth, dominating electricity production with 38% and 31% shares, respectively. Renewables expenditure is anticipated to double over the next 10 years to more than US\$1,300bn per year, and grid expenditure is likely to exceed US\$1,000bn per year in 2030. Energy security concerns are leading to renewed interest in nuclear, and the forecast this year reflects a modest uptick, growing by 13% from today's levels to 2050. However, its share of the



Image Credit: Adobe Stock

MEA countries are taking serious steps to realise their vast renewables potential.

electricity mix will still reduce to 5% by 2050 compared with 25% today.

“The turbulence in the energy market does not dramatically alter the decarbonisation pathway towards mid-century.”

The short-term increase of coal consumption will not prevent it from rapidly exiting the energy mix, peaking in 2014. Oil has been approaching a plateau for some

years, and is expected to decline sharply from 2030 onwards. Before the war in Ukraine, DNV forecast natural gas would be the single largest energy source by the end of this decade, but this has been delayed to 2048.

## Pathway to Net Zero

The Outlook this year also includes the *Pathway to Net Zero*, which is DNV's most feasible route to being on target and limiting global warming to 1.5°C. Global CO<sub>2</sub> emissions reduction of 8% every year is required to reach net zero by 2050. In 2021, emissions were rising steeply, approaching pre-pandemic all-time highs, and 2022 may only show a 1% decline in global emissions. That makes for two 'lost' years in the battle against emissions.

The goal of net zero varies between sectors, with electricity production requiring net zero before 2050, while cement and aviation will still have remaining emissions. The maritime sector would be required to reduce emissions by 95%.

According to the Pathway to Net Zero, no new oil and gas will be needed after 2024 in high income countries, and after 2028 in middle and low-income countries.

Investments in renewables and grid need to scale much faster; renewables investment needs to triple and grid investment must grow by more than 50% over the next 10 years.

DNV's Pathway to Net Zero calls for greater policy intervention than we see today

## Middle East outlook

As one of the most fossil-fuel rich regions of the world, the Middle East and North Africa has not been at the forefront of the energy transition so far, the report notes. Things are starting to change, however, with global zero-carbon targets pushing the region's countries towards developing their own carbon-neutrality targets and low-carbon fuel strategies.

Nevertheless, recent significant increases in natural gas/LNG price and demand, especially from Europe, have region producers positioning themselves to fill the supply gap. Oil and gas investment projects are being sanctioned to maintain/increase production capacity for exports (e.g. Qatar KSA, UAE).

MEA countries are taking serious steps to realise their vast renewables potential to meet growing domestic electricity demand, including that from desalination, and to diversify energy sources as an economic growth strategy. Egypt, KSA, Morocco and UAE have some of the region's largest renewable energy programmes, and Turkey has made solid progress in securing supply through renewables expansion.

Recent market and policy developments in the region indicate a clear push for green and

blue hydrogen and derivatives such as ammonia and e-methanol. State funding and state-owned companies (e.g. in oil and petrochemicals) are involved in hydrogen projects with hydrogen production building on existing fossil-fuel capacities; large natural gas resources available for conversion; excellent conditions for low-cost renewables; and nuclear-powered electrolysis as in KSA and UAE. Morocco, Oman and the UAE have published their hydrogen strategies, and Algeria, Egypt, KSA and Turkey are developing theirs.

Hydrogen production for energy purposes will grow tenfold in two decades, from less than 1 Mt in 2030 to nearly 10 Mt in 2050. In the beginning, this will consist almost solely of blue hydrogen produced via methane reforming of natural gas with CCS. Green hydrogen produced in electrolysis plants using dedicated solar electricity, and yellow hydrogen, produced via electrolysis using electricity from the grid, are expected to take off in the 2040s.

Given the potential for cost-effective production of low-carbon hydrogen and derivatives alongside the region's ideal position at the nexus of growth markets across the east and the west, Middle East and North African countries are set to become key global suppliers in the emerging global hydrogen market. By 2050, around 1.5 Mt/yr of hydrogen is expected to be transported via pipeline and seaborne trade (mainly pipeline), mainly to Europe and the Indian subcontinent, as well as around 12 Mt of ammonia via shipping to various other regions. Export is the core focus of national hydrogen strategies, with international partnership and foreign direct investment complementary pillars.

For EV deployment, policy frameworks are incipient in UAE and KSA.

## Pointers to the future for MENA:

- Renewables will expand in power

generation. Both KSA and UAE target 40-50% of their energy from renewables in 2030. Morocco aims for 52% renewable power by 2030, Egypt 42% by 2035, and Turkey's 50% target by 2023 is likely raised, as 66% was already achieved in 2020. More of the region's countries are adopting public tenders/auctions to promote renewables

- Rising electricity demand will place focus in the medium term on energy efficiency and demand-side management measures. A regional power trade will gain more rationale, as will battery utility-scale storage
- The region is expected to exploit its lowest per-barrel extraction costs with continued investment in upstream oil and gas production and liquefaction capacity. Maintaining oil supply shares to maximise government revenue will be in focus and will be successful
- Hydrogen ambitions play off the region's cost advantage in renewable electricity, as well as through CCUS. The UAE and KSA governments pursue joint funding in hydrogen industrial partnerships. Morocco expects cumulative hydrogen investments of US\$8bn by 2030 and USD\$75bn by 2050. Oman targets US\$34bn in renewable hydrogen investments by 2040. Egypt is emerging as an export hub for LNG, electricity, and green ammonia. UAE and KSA also target domestic use in industry and road transport
- UAE has a net zero ambition in 2050, Turkey by 2053, KSA by 2060. With two consecutive COP events (COP27 Egypt, COP28 UAE), the decarbonisation and energy transition focus is prevalent. There will be heightened value-chain attention to lower emissions/carbon intensity of oil and gas production (e.g. through largescale electrification such as started in the UAE), given increased carbon footprint quantification emerging in targeted export markets, and in anticipation of carbon-border adjustments. ■

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# Smart Vessel Solution for improved marine operations

MVP Tech outlines its state-of-the-art Smart Vessel Solution for better marine vessel operations. The AI and ML-powered Smart Vessels System sets up ships and sea vessels in a proactive mode, offering real-time surveillance, enhanced safety and security and powerful reporting.

## The industry – oil and gas

The demand for oil and gas continues to grow strongly globally, influencing macroeconomic and geopolitical situations. Technological breakthroughs, coupled with the rising exploration interests of different nations, make the oil and gas industry a highly sought-after and lucrative market. To deal with challenges concerning oil price dynamics and supply-demand imbalances, firms in the sector need to rely on intelligent surveillance, artificial intelligence, and machine learning to harness real-time data. Gathering and analysing data helps streamline operations, reduce costs and ensure HSE practices.

## The problem

In terms of safety, security, surveillance, decision-making, and communication, the existing offshore support systems in ships were inadequate.

Major concerns were also posed by the lack of real-time data, including the inability to recognise weather patterns, insufficient situational awareness, and inefficient staff monitoring. Last but not least, accidents can happen on seagoing vessels, particularly when there is poor visibility or when people fall overboard. Accurate data, ineffective efficiency, a lack of safety, and other issues that offer cumulative difficulties to the entire system translate to limited operating capabilities for companies in the oil and gas business.

## The solution

The Smart Vessel Solution from MVP Tech makes use of cutting-edge innovations in machine learning, artificial intelligence, and intelligent surveillance. With the use of numerous strategically positioned intelligent cameras, sensors, and audio network speakers, the system is designed to continuously scan, analyse, detect and identify issues, as well as to assist in preventing them.



Image Credit : MVP Tech

*The Smart Vessel Solution finds its application in a number of offshore and onshore vessel activities.*

The team of AI scientists and software engineers created a custom AI analytics software using MVP Tech's AI and engineering capabilities. The system will be

able to detect multiple important events or threats occurring at once, using intelligent cameras, generate an audible warning alarm via network audio speakers, and display visual alarms via the video management software on the monitors in the captain's bridge.

The solution is also capable of maintaining appropriate HSE procedures; by fostering ideal vessel conditions, it greatly enhances operational effectiveness and safety.

## The applications

MVP Tech's Smart Vessel Solution finds its application in a number of offshore and onshore vessel activities:

- **Surveillance**

The solution improves surveillance comprehensively with video management systems to cover the entire vessel,

“ The Smart Vessel Solution makes use of cutting-edge innovations in machine learning, AI and intelligence surveillance.”

including restricted areas and exit points. The cameras include tripwire built-in analytics, which would draw a virtual line across the threshold point. When the system notices that line being crossed, an alarm is automatically generated.

- **Safety**

By utilising ML to find PPE and HSE violations, the solution eliminates manual personnel checks while ensuring crew safety. Additionally, the AI-powered system can detect the periodic movement of a ship in any direction and categorise the sea condition appropriately based on a predefined threshold by automatically classifying the sea swells using an inclinometer sensor.

- **Detection**

With its continuous surveillance capabilities, the solution can detect, identify, and analyse any abnormal actions, triggering alarms and alerts to the control team for prompt mitigation. As a result, any slip and fall actions can be detected, classified, and alerted by the trained AI analytics software using ML.

- **Visibility**

Incorporating a high-powered image recognition system, the solution improves visibility by identifying objects in the surroundings. In the case of detecting a man overboard, with thermal cameras covering the vessel's sides and stern area, the AI analytics is trained to pick up and detect movements out of the vessel to avoid nuisance reoccurring alarms. Furthermore, it plots the GPS positioning of such events.

- **Communication**

The onshore command and control centres have access to real-time data during vessel movement in addition to all onboard analytics, automatically stored on the NVR (Network Video Recorder) and pushed into the central synchronisation when the vessel is back on the port via the backend wireless communication system.

## The result

MVP Tech's Smart Vessel Solution has eliminated challenges that reduce operational efficiency and safety. Notably, it has managed to be one step ahead of its competitors by achieving several critical results, which include:

- **Enhanced health & safety practices**

The solution enhances decision-making capability (e.g., by analysing weather patterns), provides a safe working environment, and promptly detects abnormal behaviour.

- **Real-time access and communication**

The solution minimises uncertainty by providing real-time video access to the onshore command and control centre.



Image Credit: MVP Tech

*The Smart Vessel Solution has eliminated challenges that reduce operational efficiency and safety.*

The solution achieves this with an AI cloud system, a central repository for local video and data information on board. With real-time data, the centre can ensure vessel security and empower vessel operations with powerful analytics.

- **Reduction in costs**

The solution elevates the role of the onshore command and control centre as it communicates and controls multiple vessels. This brings about better decision-making, ultimately reduces operating costs and leads to better utilisation of resources.

- **Improved navigation**

The built-in AI functionality helps in the better detection of objects in the surrounding area. The solution assures intelligent surveillance by generating alarms and providing the quickest post-event analysis.

- **Automated crew safety checks**

The Smart Vessel Solution automatically detects PPE and HSE violations; it also detects security hazards concurrently throughout the operation.

- **Eliminating accidents**

The solution is designed and developed to classify sea swells as red, yellow, or green, with green indicating normal conditions, yellow indicating warning conditions, and red indicating alarming conditions. Also, the Man Overboard Analytics Detection System monitors man-overboard events and triggers immediate, actionable information to response personnel. Furthermore, intelligent cameras can detect the exact GPS location of the fall, mitigating risks even in unfavourable climatic conditions.

This solution has demonstrated not only measurable benefits but also an excellent ROI for existing customers.

## Vendors



## AI stack

YOLO Detection, C-Sharp, Central Tracker

## About MVP Tech

MVP Tech since its launch in 2003, has sought to revolutionise the security and IT systems integration industry in the Middle East. Operating at the forefront of innovation, MVP Tech has been experimenting and working with AI and video analytics for years, developing real-world applications for both private and public sectors. They were also among the first to deploy PSIM (Physical Security Information Management), now CSIM (Converged Security and Information Management) to provide real-time actionable information seamlessly to operators. ■

*For more information on how MVP Tech is driving the future of Security, IT Infrastructure and AI Software, contact:*



# Spotlighting a secure, affordable and sustainable energy future

The UAE will be at the heart of the global dialogue on the future of energy, as more than 40 international ministers gather in Abu Dhabi for ADIPEC 2022, the world's most influential forum for the energy industry.

**H**OSTED BY ABU DHABI National Oil Company (ADNOC), ADIPEC 2022, which takes place from 31 October to 3 November at the Abu Dhabi National Exhibition Centre, is the global platform for energy leaders to discuss and outline strategies and commitments that will drive the industry towards reducing emissions, meeting decarbonisation goals, and providing invaluable viewpoints on short- and long-term energy outlooks.

With COP27 starting in Egypt the week after ADIPEC, and COP28 coming to the UAE in 2023, policymakers are expected to discuss solutions to the energy security and sustainability challenges, including how to respond to current global energy-market challenges while delivering on climate action and sustainability commitments.

The UAE has taken a leading role in ensuring basic energy needs of today are met, and economies do not slow down, because that will put the brakes on much-needed investment in climate action.

Tayba Al Hashemi, chair of ADIPEC 2022 and CEO of ADNOC Sour Gas said, "Abu Dhabi and the UAE are increasingly seen at the heart of the global dialogue on the future of energy, evidenced by the record number of global government ministers attending. It is an event that convenes the global energy industry and is accelerating a pragmatic and progressive energy transition by ensuring we maintain investment in the energy we need today, while investing in the energies of the future.

"This year, ADIPEC takes place against a backdrop of changing global energy and geopolitical landscapes, with the energy trilemma of balancing cost, sustainability, and security in sharp focus for populations and energy producers around the world. Taking place just one week before COP27 in Egypt and one year before COP28 in the UAE, ADIPEC will provide an important platform for industry, innovators and policymakers to demonstrate the strategies, climate action and investment required to help accelerate the



Image Credit : umg events

*H.E. Dr Sultan Ahmed Al Jaber, Minister of Industry and Advanced Technology, UAE, special envoy for climate and group CEO of ADNOC speaking at ADIPEC 2021.*

transition and deliver decarbonisation."

The eight ministers from the MENA region, representing some of the largest energy producers in the world, confirmed to speak in the daily ministerial panels are:

- H.E. Dr Sultan Ahmed Al Jaber, Minister of Industry and Advanced Technology, UAE

“ Abu Dhabi and the UAE are increasingly seen at the heart of the global dialogue on the future of energy.”

- H.E. Suhail Mohamed Faraj Al Mazrouei, Minister of Energy and Infrastructure, UAE
- H.E. Dr Mohammad Abdullateef Al-Fares, deputy Prime Minister, Minister of Oil and Minister of State for Cabinet Affairs, Kuwait
- H.E. Dr Mohamed bin Mubarak Bin Daina, Minister of Oil and Environment and special envoy for Climate Affairs, Kingdom of Bahrain
- H.E. Tarek El Molla, Minister of Petroleum and Mineral Resources, Arab Republic of Egypt
- H.E. Dr. Saleh Al Kharabsheh, Minister of Energy and Mineral Resources, Jordan
- H.E. Ihasan Abdul Jabbar Ismail, Minister of Oil, Iraq
- H.E. Eng. Zafer Melhem, Minister of Energy

and Natural Resources and chairman, Palestinian Energy Authority. Ministerial panel discussions at ADIPEC 2022 will encompass the most pertinent geopolitical, sustainability and economic issues around the future of energy supply, security, and affordability, including sessions on “Geopolitics of today: how the energy industry is navigating through change”, and “COP27: key policy considerations to deliver net-zero ambitions in an uncertain time.”

With more than 150,000 attendees at the event, the ADIPEC strategic conference programme provides strategic and technical insights by convening more than 1,200 global policymakers, energy CEOs, and industry professionals to discuss key trends shaping

the future of energy, the challenges and opportunities of the energy transition, geopolitical shifts, new finance and partnership frameworks, and the latest technological developments.

The strategic conference at this year’s ADIPEC will enable the anticipated 12,000 conference delegates to gain early insight into how governments around the world are navigating this narrow path.

The panels are part of this year’s expanded conference, with more than 350 sessions scheduled across a comprehensive strategic and technical programme. Attending delegates will have in-person access to hear influential, expert voices and a broad range of up-to-the-minute content from more than 1,200 industry and ministerial speakers.

Christopher Hudson, president of dmj events, organisers of ADIPEC 2022 said, “ADIPEC attendees will once again hear from a stellar line-up of speakers, drawn from the very pinnacle of the global energy industry and government.

“This is testament to both the convening power of ADIPEC, bringing together policymakers, industry leaders and energy professionals from around the world, as well

as its role as a forum to address the key current issues faced by the energy industry and develop the ideas and solutions that will shape the future of energy. I am looking forward eagerly to this year’s high-level strategic dialogue, which will undoubtedly be both an influence upon, and preview of, discussions at COP27.”

As well as government ministers, the strategic programme at ADIPEC 2022 will be a platform for high-level industry leaders to give insights into strategy, policy and the future of energy. Participating leadership from key regional companies includes ADNOC Group CEO H.E. Dr Sultan Ahmed Al Jaber, and Mubadala Energy CEO, Mansoor Mohamed Al Hamed.

ADIPEC 2022 will also feature a new Decarbonisation Zone, providing a focus on methane, hydrogen, Carbon Capture Utilisation and Storage (CCUS) and new energies, which will spotlight the industry’s path towards net-zero through deployment of cleaner forms of energy and innovative technologies. ■

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

“ This year, ADIPEC takes place against a backdrop of changing global energy and geopolitical landscapes.”




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# Connecting capital markets with energy stakeholders

NESR VP Investor relations and ESG impact, Blake Gendron, discusses the once-in-a-generation energy upcycle currently unfolding in MENA, underpinned by a heightened focus on sustainability and uniquely marked by the emergence of Voluntary Carbon Markets (VCMs) that are poised to connect industry stakeholders and global capital markets.

**How do you view the outlook for your business in the MENA region? What are the main challenges and opportunities?**

The outlook for upstream energy investment in MENA is the best that the industry has seen in several decades. Many years of structural underinvestment in supply, combined with energy security demand drivers globally, has created an environment in which MENA is poised for a significant, multi-year expansionary cycle. For NESR, there are exciting opportunities in traditional oilfield services, including landmark contract wins in the high-end Directional Drilling market, and also in decarbonisation technology through NESR's ESG Impact segment.

**What priority does NESR attach to supporting the energy transition and emissions reduction?**

NESR announced its newest business segment, ESG Impact, during the 2021 FII in Riyadh as a pivotal strategic commitment to upstream decarbonisation through NESR's unmatched open technology platform. Since the announcement, NESR has formalised more than a dozen partnerships with, and equity investments in, ESG Impact technology innovators across water treatment, emissions detection, flare management/CCS, and heat capture. Driving decarbonisation through nimble technology importation and development is a leading priority and business growth objective at NESR.



Image Credit : NESR

*Blake Gendron, NESR VP Investor relations and ESG impact.*

**How are you supporting your customers in their decarbonisation and sustainability objectives?**

NESR has executed several flagship ESG Impact projects. In Saudi, the company successfully implemented a circular economy water treatment solution to produce freshwater (<100ppm) from high salinity produced water, proving that the industry can be a net supplier of water resources to the region. In Iraq, the company deployed different water treatment technology to produce workover fluid from brackish reservoir water, thereby shielding consumption of precious RO freshwater at the NESR brine plant. Additionally, NESR continues to gain traction with pilot projects in methane detection, flare capture, and carbon

“ VCMs unlock carbon abatement as a value stream.”

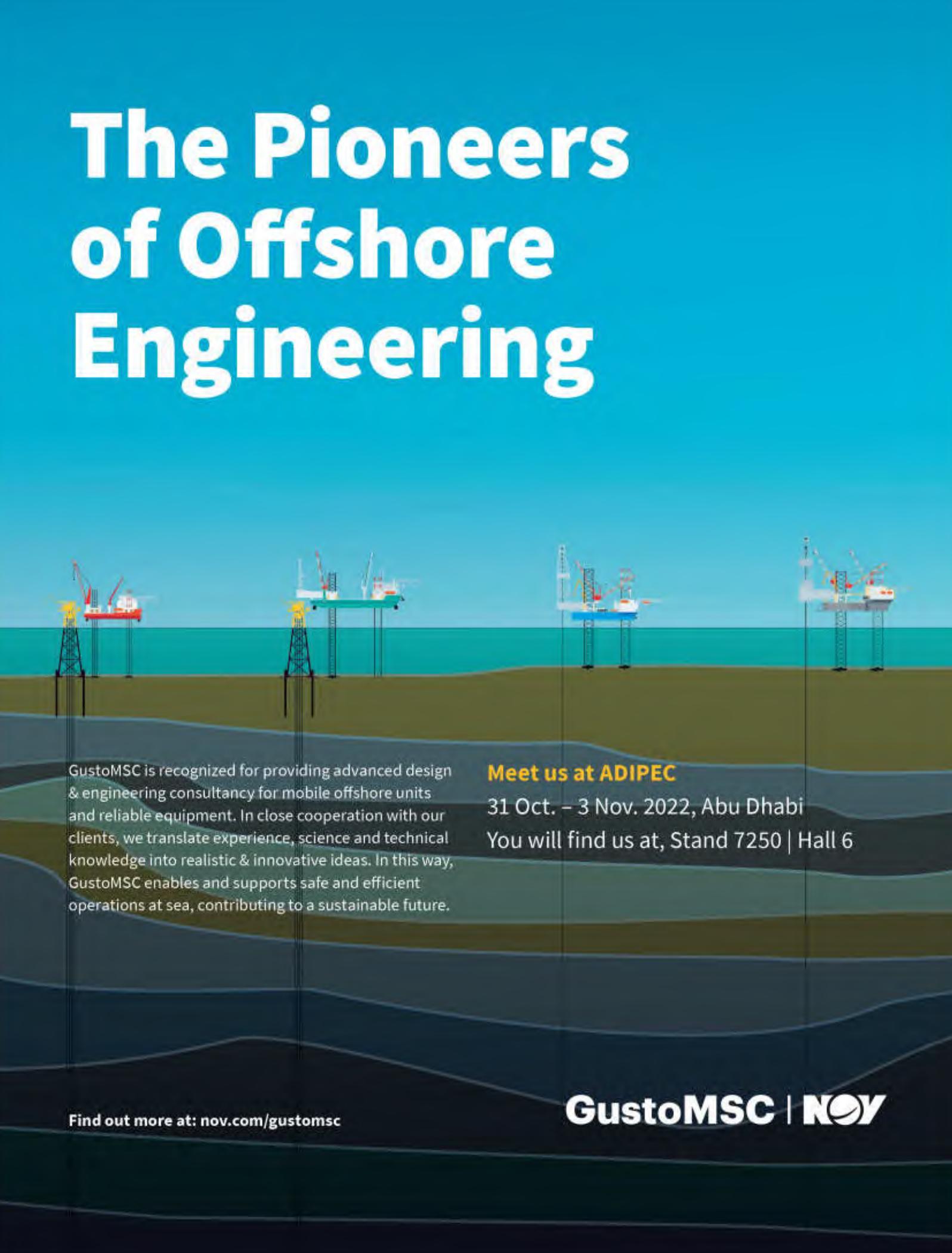
capture & sequestration (CCS) elsewhere in the MENA region.

**What role do Voluntary Carbon Markets (VCMs) play in accelerating the decarbonisation journey of MENA and the energy industry?**

Technology development aimed at lowering the carbon intensity of energy production is only half the battle, as investment capital and project financing are also needed to support technology deployment & proof-of-concept in the field. Visionary NOCs like Saudi Aramco & ADNOC are leading the way in terms of R&D investment, but NESR also sees the emergence of Voluntary Carbon Markets (VCMs) across MENA as a critical catalyst to connect technology providers such as NESR to global capital markets that are hungry for sustainability projects to invest in. VCMs unlock carbon abatement as a value stream, and represent a key investment driver for a particular project, in the form of Carbon Offsets (measured in CO<sub>2</sub>e tons) that can be traded and retired by companies with ambitious carbon neutrality targets to meet. Holistic collaboration between VCM architects, VCM standard-bearers & methodology-setters (such as the UN Framework Convention on Climate Change), independent project auditors, country resource ministries, and local communities can ensure that decarbonisation projects benefit in-country stakeholders by supporting ICV and localisation of human capital and supply chains. As the National Champion of MENA, NESR is proud to participate in and support the burgeoning VCMs in the region. ■

“ There are exciting opportunities in traditional oilfield services, and also in decarbonisation technology.”

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## AVEVA to highlight the business and sustainability benefits of digital transformation for the energy sector

AT ADIPEC, AVEVA, a global leader in industrial software, driving digital transformation and sustainability, will showcase its portfolio of industry-leading offerings that empower oil and gas and energy companies to fast track their digital transformation and sustainability journeys.

Digitalisation and sustainability are hot topics in the oil & gas and energy sectors, as companies look to find new efficiencies, better serve customers and decarbonise operations. AVEVA's cutting edge solutions leverage cloud, artificial intelligence (AI) and digital twin technology combined with human insight to help industries tangibly boost operational delivery and sustainability at every level.

AVEVA CEO Peter Herweck will speak on 'Delivering the energy needs of today while investing in the energy systems of tomorrow' at a strategic panel on 1 November. The session runs from 2.30pm to 3.30pm in the ICC Hall. The thought-provoking discussion will shine a light on how international oil companies (IOCs), integrated energy companies (IECs) and national oil companies (NOCs) can decarbonise operations and create new partnerships and capabilities to achieve net zero goals, while producing and delivering energy to meet the world's growing demands.

"AVEVA's solutions have already enabled 19 of the world's top 20 petroleum companies to embrace digital transformation and realise significant business and environmental benefits. As requirements to remain competitive and deliver value while meeting climate targets pervade the energy sector further, organisations must make a conscious decision to begin their digital transformation journeys and take advantage of data and innovative automation tools to evolve and thrive," said Evgeny Fedotov, senior vice president and head of EMEA region.

AVEVA's chief operating officer, Caspar Herzberg, and Evgeny Fedotov will also be present at ADIPEC 2022 at AVEVA's booth through the exhibition and will participate in the conference's extensive agenda. Arvin Singh, global APM executive business leader, will lead a presentation on integrating real-time optimisations with advanced process control for optimum energy management and optimisations on 1 November between 11.50am and 12.10pm,

while Michele Cacciari, global oil & gas segment lead, will discuss how digital technologies can help companies overcome decarbonisation challenges on 1 Nov between 11:30 and 11:45. Additionally, Joachim Boese, industry principle for oil and gas, will lead a presentation about an integrated approach, driving towards optimum operational excellence and sustainability.

AVEVA will host a number of live demonstrations at its booth to help customers learn about the latest digital technologies that can enable them to improve capital project sustainability, increase process energy efficiency, uncover profitable pathways to Net Zero, improve asset reliability and connect assets, process, and people using digital twin.

AVEVA will be exhibiting at ADIPEC 2022 in Hall 4 at the Gasos pavilion, booth 4410, and, as AVEVA's partners, Schneider Electric and Microsoft will be running AVEVA demonstrations at their respective booths.



Evgeny Fedotov, chief operating officer, AVEVA.



Peter Herweck, CEO AVEVA.

## Celeros FT to demonstrate flow control solutions

AT ADIPEC 2022, Celeros Flow Technology is focused on providing fully customised flow control solutions that respond to the diverse process challenges of transitioning from fossil fuels to renewable resources such as biofuels and biomass.



High-capacity filtration systems from Celeros Flow Technology deliver excellent contaminant retention with minimal impact on process parameters.

"The development of new, purpose-designed facilities is important, but the energy transition also requires the conversion of existing oil and gas infrastructure if we are to meet 2050 targets," said Shane Moynihan, regional director, Middle East. "This is a real challenge for operators because 'green' fuels can have very different requirements in terms of pressure, temperature and viscosity for example. Celeros Flow Technology offers both the lifecycle engineering expertise and high quality OEM equipment to help customers become more sustainable: optimising production and reducing operational and environmental impacts."

Comprehensive aftermarket support also ensures that renewable energy operations continue to function efficiently throughout their design life, with the ability to augment operational parameters or modify processes to accommodate new feedstocks as they emerge.

Products on display will include pump and valve technology that keeps greenhouse gas emissions to a minimum and significantly lowers the electrical consumption involved in production. Also on show will be filtration solutions that remove contaminants to protect equipment downstream and optimise product quality, and quick opening closures to allow rapid, safe and efficient access for maintenance.

Senior representatives from Celeros FT will also present a technical paper on *The Role of Filtration in the Reduction of Foaming In Gas Sweetening (Amine) Systems* during this year's conference.



# How to optimize every phase of a digital asset lifecycle?

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Whether you are in operations, security, or program management, Hexagon can help you ensure that your organization is armed with the security and digital foundation to grow in today's digital world.

Hexagon's digital solutions place safety at the heart of everything we do. Our digital transformation program can be implemented with your existing systems to provide a deep layer of security that extends to all areas of your organization.

Hexagon's digital transformation program helps you implement a strategic digital foundation so your organization can increase operational efficiency and drive revenue, all while keeping your assets safe and secure. We help you drive tomorrow's success. Today.

**Hexagon empowers your Smart Digital Reality, a unified, role-based, real-time view of the physical and digital realities across your project and asset portfolio.**

## Teledyne Gas & Flame Detection to showcase gas detection solutions at ADIPEC

AT BOOTH 9413 in Hall 9, Teledyne Gas & Flame Detection will showcase its reliable, high-quality, proven gas detection and monitoring technologies, shining the spotlight on several proven products that enhance safety and bring even more capabilities to the oil and gas sector.

Visitors to the booth will also discover how Teledyne will meet the gas detection demands of the giant Hail and Ghasha sour gas project that is currently in development off the UAE coastline.

Among the class-leading products on display from Teledyne GFD will be the GD1 hydrogen sulphide (H<sub>2</sub>S) laser detector, which features a unique, customisable laser diode that, rather than emitting a conventional straight beam of light, travels as a cone from one point to another, enabling it to penetrate harsh environments. The GD1 also performs real-time auto-calibration and auto-proof testing, and provides a very high sampling or detection rate i.e., 8000 times/sec. Well over 800 units have been deployed in the field since 2011.

Also in the spotlight will be the GD10P infrared gas detector with full firmware upgrade, enhancing the product's performance in high demand mode SIL2 approved applications; and the GD10PE infrared point gas detector, which is ideal when users need fast, reliable detection of low gas concentrations.

Another exciting innovation launching at the show is Spyglass, a brand-new range of flame detectors offering integrated high-definition CCTV video that facilitates the clear, rapid imaging of fire and people at unprecedented distances. When connected to a DVR/NVR, the rescue team becomes aware of the exact situation before entering the hazardous area.

Teledyne's product portfolio houses a variety of detection technologies, including fixed, portable and wireless, as well as area monitors. Sometimes a mix of solutions can improve reliability and availability, as evidenced in the company's proposal for the enormous Hail and Ghasha sour gas development, which is set to go live in 2024, where the company proposed fixed gas detectors connected via a wireless mesh as a primary means of detecting LEL explosive gases and hydrogen sulphide gases. The solution also includes a second line of defence, utilising a mesh network of Teledyne's field proven BM25 wireless area monitors.

The BM25 will be on display at the booth, alongside other Teledyne industrial gas and flame detectors – both fixed and portable, including the wireless CXT. Personal gas monitors on view will include the PS200, PS500 and Protégé ZM, while a 'Solution Wall' will showcase DG MOS detector with Telecapteur asset management software, as well as the high temperature SIL 2 DF flame detector.



*The company's gas detection and monitoring technologies help to enhance safety in the oil and gas sector.*

Image credit: Adobe Stock

## Enhancing Middle East reservoirs

AS A MATURE petroleum province, the Middle East is increasingly turning its attention to reservoir management, optimising production to extend the life of mature and existing fields.

Seismic data has long been a tool of choice for reservoir management teams, providing the data required to identify where further oil and gas reserves exist. Traditionally, cabled seismic acquisition technology has dominated seismic surveys in the Middle East. However, as the industry pushes for higher-resolution imaging required to pinpoint optimisation opportunities, the challenges of deploying cabled equipment have become more apparent.

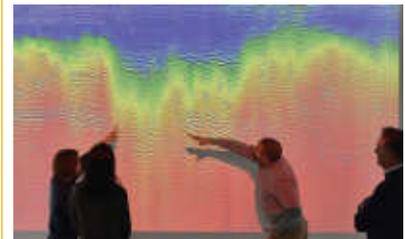


Image credit: STRYDE

*Seismic data is very valuable for reservoir management.*

STRYDE Nodes have been ground-breaking for such projects. This game-changing solution is lightweight, lower-priced, and easily transportable, enabling operators to acquire high-density surveys that produce high-resolution images of the geology beneath our feet, offering a better subsurface visual guide to secondary recovery techniques to enhance recovery.

This miniature nodal acquisition system significantly reduces cost, seismic crew size, and logistics, resulting in less exposure to HSE risk, and creating a step-change in land seismic operations.

The technology is now being adopted as the nodal receiver technology of choice across the MENA region. The technology opens a world of opportunity, allowing ambitious market-leading operators to efficiently optimise capacity from existing reservoirs, explore large-scale survey areas or projects previously untapped because the exploration phase was either uneconomical or impractical.

In addition to being a tool for production optimisation, STRYDE's technology is also being used extensively for the exploration and monitoring phases in growing industries including carbon sequestration, geothermal, mining, and hydrogen.

*For more information see the website at <https://www.strydefurther.com/> STRYDE will be exhibiting at ADIPEC on stand A20.*

## OPEC World Oil Outlook to be launched at ADIPEC

THE 2022 OPEC World Oil Outlook (WOO) will be launched at ADIPEC. The launch event will be held in the ICC Room on Monday, 31 October 2022 at 4.30pm UAE local time.

OPEC's Secretary General, HE Haitham Al Ghais, along with OPEC experts, will present the major findings of the WOO 2022, as well as introduce a video with key messages from the publication's 16th edition. This will be followed by a panel discussion and Q&A with management and analysts from OPEC's Research Division. The launch will also feature keynote remarks from Ministers and CEOs of oil companies.

First published in 2007, the WOO provides an in-depth review and analysis of the global oil and energy industries, and offers assessments of various scenarios in the medium- and long-term development of the oil industry. The publication provides insights into the upstream and downstream, supply and demand, investments, the potential impact of policies, and issues related to environment and sustainable development. It also provides expert analysis of many of the challenges and opportunities facing the global oil and energy industry.

HE Al Ghais said: "The WOO is an indispensable reference tool that underscores the Organization's commitment to impartial analysis, data transparency and the enhancement of dialogue and cooperation. This is extremely valuable given events in 2022, and the challenges and opportunities the energy industry will face in the years and decades ahead."



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*Al Turki project - Oman*

# Forged from the past. Engineered for the future

Alleima is advancing processes and applications in the most demanding industries through unique materials.

**A** LLEIMA (FORMERLY SANDVIK Materials Technology) is a leading manufacturer of high value-added products in advanced stainless steels and special alloys, as well as products for industrial heating. Its origins date back to 1862 and the foundation of the company Sandvikens Jernverk by Göran Fredrik Göransson, a pioneer in using the Bessemer method for steel production on an industrial scale. Headquartered in Sandviken, Sweden, Alleima recorded revenues of SEK 13.8bn (US\$1.2bn) in 2021. It has more than 5,500 employees and customers in around 90 countries.

Based on long-term customer partnerships, the company advances processes and applications in the most demanding industries through unique materials that are lightweight, durable, corrosion-resistant, and able to withstand extremely high temperatures and pressures.

With more than 900 active alloy recipes, Alleima's offering comprises products for several customer segments, mainly seamless tubes for the energy, chemical, petrochemical, oil and gas industry.

Sustainability is present in all aspects of the company's operations and is an integral part of its commercial strategy. The product offering enables the transition to renewable energy sources, electrification of industries, innovation in the medical sector and much more. Alleima also actively seeks to reduce and eliminate harm to people and the environment through its operations. Today, the amount of recycled material in Alleima products is above 80%.

Alleima's fully integrated value chain, from R&D to end-product, ensures industry-leading technology, quality, sustainability, and circularity. Its passion for materials technology,



metallurgy, and industrial processes helps customers become more efficient, more profitable, more sustainable, and safer.

Learn more at [www.alleima.com](http://www.alleima.com). You can also view the company's social media channels, Facebook | Instagram | LinkedIn | Twitter and request to join the LinkedIn group, AST - Advanced Seamless Tubing. This is a group for specialists in advanced stainless steels and special alloys to share technical and industry information, all in aid of productivity, process reliability and cost efficiency, with reduced environmental impact, in a variety of demanding applications. The group is a valuable forum for sharing ideas and knowledge towards developing products and materials which can meet the challenges of the future.

## Alleima at ADIPEC 2022

The Alleima booth at ADIPEC 2022 will showcase Sanicro® 35, a cost-effective

solution for conversion of fossil fuel to renewable fuel and the latest range of tube products for the upstream and downstream markets, including the oil and gas subsea sector, refineries and processing plants, where high corrosion resistance is needed, such as hydraulic and instrumentation, heat exchanger, OCTG tubing and control lines.

ADIPEC is a key exhibition for Alleima, which supplies its products to all major oil and gas companies in the Middle East region, whether directly or indirectly. The company continues to see growth in the region, and the demand from customers is rising.

The Alleima team of experts will also discuss technical subjects and advise on suitable materials for various challenges and issues faced by different industries. ■

Visit Alleima at booth 316, Hall 3 to explore its range of tube products and to speak with experts on-site.

**Sponsored**

“ Sustainability is present in all aspects of the company's operations.”



# Drive Data to Barrel, Embrace Intelligence to Grow

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Huawei in Oil & Gas

# Improving operations with Smart Digital Reality

Joseph El Bitar, vice president and general manager of Hexagon PPM Middle East, outlines its “Smart Digital Reality” vision and how it can help customers achieve safe, sustainable and efficient operations.

*Digital transformation brings significant benefits in terms of efficiency, productivity, safety and sustainability.*



Image Credit : Adobe Stock

**What was the rationale behind changing your company’s name from Hexagon PPM to Hexagon Asset Lifecycle Intelligence, and how does it reflect the company’s current vision?**

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications. The rebranding from Hexagon PPM to Hexagon Asset Lifecycle Intelligence is being driven by a common set of goals and values of our customers, including the need to have real-time intelligence of their assets, as announced by our President Mattias Stenberg in Athens earlier this year during our Sales Kick-off. This evolution is reflective of our “Smart Digital Reality” vision, where we deliver to our customers “a based role single pane of glass” where they operate with improved quality, safety, efficiency, and productivity, all of which contribute to economic and environmental sustainability.

**How would you define the digital twin, and what are the main benefits for oil, gas and petrochemicals companies? How does it enable a ‘single version of the truth’?**

Hexagon’s core technology competencies enable a digital reality feedback loop – creating freedom of insight so you can be proactive, preventative, and event-predictive. Our “Smart Digital Reality” vision goes beyond just a visual representation of an asset; it is infused with intelligence to automate processes and analytics, increasingly removing human intervention on the journey to a fully autonomous future.”

Whether during new facility construction or existing facility operations, data is captured and processed via our proprietary Digital Backbone. Context is added by layering 1D documents and specifications and 2D schematics over 3D models, regardless of the source, i.e. our solution is source and vendor agnostic.

Hexagon’s value proposition is “the single pane of glass”, where the ultimate goal is to deliver safety, efficiency, quality and productivity, and to ensure that these values are connected to work processes in a measurable way.

This single source of truth provides a full visibility to our customers on all actions, corrective actions and decisions that they need to take underneath the areas of [Plant, Design, Execute] for Digital Projects and [Operate, Maintain, Sustain] for Digital Assets specific to the individual’s role. Leveraging data to its fullest potential is the outcome we want – moving beyond automation to autonomy. And in order to support those processes and to personalise and visualise them as per the individual’s role, understanding and leveraging the data is key, as this data will streamline into Hexagon Digital Backbone (from whatever is the

“ Visit Hexagon’s stand at ADIPEC (No. 13200) to learn more about how your company can achieve excellence with “Smart Digital Reality solutions.”



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Everything is new, nothing has changed. Sandvik Materials Technology is now Alleima, our quality stainless steel and alloys remain the same.

Read more at [alleima.com](http://alleima.com)

source) that consolidates, smartifies and contextualises the data in that role-based single pane of glass.

### How can Hexagon help companies with their Digital Twin journey across the asset lifecycle?

Hexagon's "Smart Digital Reality" for Industrial Facilities is a platform that helps companies maintain safe and sustainable operations, achieve the lowest practical cost and optimise plant production and worker productivity by facilitating the capture and integration of data from any source, contextualising, visualising and then facilitating work process enhancements across the entire asset lifecycle, represented by "Digital Projects" and "Digital Assets", all facilitated by the "Digital Backbone". The result enhances execution of work processes that run natively within this highly intuitive environment. It allows consumers to generate new insights about the asset in support of faster, more accurate decisions and actions that lead to improvements in safety, quality, efficiency, and productivity, all of which contribute to economic and environmental sustainability.

Hexagon's Digital Twin strategy and vision addresses all the challenges and barriers to the successful creation and maintenance of the Smart Digital Reality.

### To what extent are refining and petrochemicals companies aware of the benefits of digital transformation and looking to implement the digital twin? Are there any use cases you could highlight?

As a result of the pandemic, digital transformation is accelerating, but data shows that only a handful of digitally-ready leaders are capturing more market share. Data, and more precisely data into context, has always been needed to make decisions. Hexagon's proprietary Digital Backbone provides data consolidation and interoperability to ensure all data sources are captured and applied in context of the work processes within our Digital Projects and Assets solutions. A key success factor in today's new normal, is that Hexagon, as an organisation, is well equipped with robust remote working tools along with its wide portfolio of digital solutions that embrace a successful digital journey.

Over one half of all oil, gas, and chemicals products worldwide are delivered more efficiently due to Hexagon technology. Hexagon has supported these organisations to reduce costs by increasing efficiency, even at the pandemic peak. Admittedly, adopting digital technologies alone isn't enough, and companies will need to analyse the role they play in the digital ecosystem, identify the partners they will need to work with and acquire the capabilities that they need to succeed. Doing so will enable companies to capture the benefits of digitalisation, mitigate threats, and take advantage of disruptions – all of which are essential to sustainability.

At the resource centre available on our website you can find our customers' success stories all across the globe and the most up-to-date content about digital transformation, as well as the latest product information and industry research.

### How successfully can digital twins be introduced on legacy facilities?

Successful Digital twins for legacy facilities have always been a proof of the robustness of the solution as well as its sustainability. So, if the "Smart Digital Reality" is to deliver its promise, we must have a way of creating and maintaining it for both new and existing facilities. Although creation of the Digital Reality is a one-time effort, it must be proactively maintained on a daily basis, as changes to design and operating parameters are constantly changing. For new facilities, it is easy to understand how the Digital Twins and Threads are created, as a function of the normal design, engineering, construction and handover process.

This might not be as evident for existing facilities which were either not designed using a 3D model, or the model is out of date. Not to mention the barriers of multiple data formats from basic files and unintelligent native formats. Fact is, today there are many more existing facilities than will probably ever be built in the future.

Hexagon's vision is to remove these barriers by automating the handover, tagging, and back-modelling of new and existing assets, smartifying the data, and connecting the Digital Project and Assets worlds using integrated solutions within the Digital Backbone. This will vastly reduce the time, cost, and complexity of creating and maintaining Smart Digital Realities for every industrial facility on the planet. This vision will maximise the economic and environmental impact.

### To what extent are ESG and sustainability concerns a driver for digital twin implementation, and how can the digital twin help to promote sustainable operations?

Most companies we work with want growth and to boost safety, quality, efficiency and productivity, for both new and existing facilities. The good news is that continued growth does not have to be at the expense of environmental sustainability. We can make an immediate difference just by focusing on existing facilities and assets, to make them more self-efficient and self-sustainable, to extend their lifecycles and to reduce construction and demolition waste.

With fossil fuel and renewable energy production projected to significantly lag energy demand for decades to come, every step our customers take to improve their own sustainability counts. Hexagon solutions contributes to a more sustainable planet:

- Reduces rework in construction from 15% to 1%



Image Credit : Adobe Stock

Joseph El Bitar, vice president and general manager of Hexagon PPM Middle East.

- Reduces scrap rate at factories by 20%
- Increases wind turbine efficiency by 30%
- Reduces weight of components by 20%

On a group level, Hexagon in February announced the launch of a new sustainability programme with key environmental, social and governance (ESG) goals centred around carbon emissions, supplier audits and gender diversity.

Hexagon's innovative solutions already contribute to environmental and social sustainability by improving efficiency, quality and safety in a broad array of industries and societal applications. But its sustainability journey is not only determined by the role its solutions play in the market, but also by its own processes and actions. In the context of growing ESG importance and Hexagon's recent pledge to further its ESG focus, the programme aims to accelerate its commitment to respect planetary boundaries, generate positive social contributions and ensure robust corporate governance. It outlines ESG targets for 2023 and beyond, embracing goals to significantly reduce its carbon footprint, better manage supply chain risks and improve gender balance across leadership positions.

### ESG targets include:

- Carbon neutrality in its scope 1 and 2 emissions – by 2030
- Carbon neutrality across its entire value chain in scope 1, 2 and 3 emissions – by 2050
- Sustainability supplier audits across 100% of its direct suppliers, in risk areas –by 2023
- At least 30% of its leadership positions filled by women – by 2025.

The targets will be achieved through various activities – from increasing energy efficiency across its facilities while reducing carbon emissions from business travel and company fleets, to an increased focus on sustainability in the product design phase, stronger supplier audit processes, and initiatives that build and nurture an inclusive culture while attracting and retaining diverse talent. ■

## WEG to showcase drives and digital tools at ADIPEC

GLOBAL MOTOR AND drive manufacturer, WEG will launch its new variable speed drive (VSD) for the oil and gas sector, the CFW900, and the Motion Fleet Management (MFM) digital tool for asset management, now available to the Middle East market.

The new CFW900 drive is an addition to the well-established CFW range of frequency inverters. This range of variable speed drives (VSDs) boasts increased power density, speed control in industrial applications and can be used to greatly improve efficiency in oil, gas and petrochemical applications.

The CFW900 collaborates with a range of new digital tools from WEG, including Motion Fleet Management (MFM). MFM is a control and monitoring tool for the operation of industrial assets including compressors, pumps and fans, using cloud computing and the Internet of Things (IoT) technology, which generates valuable real-time insights on motors, drives and other industrial assets. Based on real data, it allows engineers to make informed decisions about the efficiency and effectiveness of assets – leading to improvements in production processes.

Also being shared at the show is WEG Motor Scan, a remote and intelligent monitoring device for electric motors, which is used within MFM. The technology uses artificial intelligence (AI) and machine learning (ML) to diagnose, monitor and indicate predictive maintenance in electric motors, gearboxes, pumps compressors and other plant assets.

“Digital technologies are becoming increasingly present in all manufacturing operations and the oil and gas sector is no exception,” explained Marek Lukaszczuk, marketing manager for WEG Europe and the Middle East. “A key part of WEG’s ethos is to help our customers meet their efficiency goals – and the products we are launching at ADIPEC will certainly do this.

“The new digital portfolio from WEG has been developed to fulfil increased customer demand, with the goal to help plant managers improve plant efficiency and better manage maintenance through digital solutions.

“ADIPEC provides a crucial platform for the sector to demonstrate climate action and investment through global collaboration and innovation. With COP27 taking place just one week



Image Credit: WEG

The WEG CFW900 VSD.

after the show, ADIPEC will kick off the climate conversation. WEG looks forward to demonstrating how the technologies can optimise industrial applications by improving energy efficiency.”

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# Five reasons to choose TruePix direct-view LED for your control room

**H**ERE ARE FIVE reasons why TruePix LED technology is a great idea for your control room.

## Reason #1

### Accurate visualisation of critical content

Control room operators need to be able to view their video wall content with full confidence. They need to be sure that there are no missing details that can lead to slow or wrong decisions. Barco's TruePix LED platform ensures accurate visualisation of critical content in impeccable image quality through a combination of smart engineering and advanced image processing:

- A flat wall and seamless image, thanks to perfectly aligned LED modules and a self-regulating wall structure
- High-performance processing platform Infinipix Gen2, which ensures colour accuracy and contrast at any brightness level
- Colour-critical accuracy in both dimmed mode and at full brightness with the same colour tone, colour bit depth, grayscale and level of detail

## Reason #2

### Improved operator well-being

Operators can easily get physically drained doing long shifts of focused work. This can cause a state of impaired alertness, which may result in slower reaction times. Driven by Barco's Infinipix Gen2 processing platform, TruePix allows operators to see bright and sharp images for all types of content, with uniformed colours across the overview display. This offers the highest viewer comfort, prevents eye fatigue, and reduces stress levels.

## Reason #3

### Ready for 24/7 operations

Today's control rooms need a video wall that is up and running 24/7. TruePix is the best guarantee for efficient, uninterrupted service and maximum profitability.



Image Credit: Adobe Stock

LED technology is ideal for control rooms due to accurate visualisation and impeccable image quality.

- Redundancy of several critical components to maximize uptime in case one component fails
- A smart failover system to ensure an uninterrupted data flow
- High serviceability and easy module replacement, reducing service downtime to a minimum

## Reason #4

### Easy, risk-free installation

The installation of a video wall is critical because a faulty setup may result in clearly visible anomalies, such as large gaps between LED panels. TruePix is the first LED video wall platform that pays so much attention to a seamless, risk-free installation.

- A smart mounting structure that neutralises imperfections of the underlying wall surface
- A camera-guided module placement, reducing the risk of LED damage
- Full front and rear access, which makes installation easier and less intrusive.

## Reason #5

### Long-term supportability

A video wall is an investment for the long haul. Barco has been investing continuously in technologies and services that make LED a safe choice for many years.

- 10 years of dedicated support for your system
- Fast fixing with fully batch-compatible modules
- Remote video wall management
- Barco's EssentialCare and SmartCare services
- Solid network of regional service partners

### The time is now for LED

There has never been a better time than now to invest in LED. With the introduction of Barco's revolutionary TruePix platform, the future looks bright for LED in control room applications. ■

*Do you want to learn more? Then download our ebook '5 reasons to choose Barco TruePix' on [www.barco.com/ebook-5reasons](http://www.barco.com/ebook-5reasons). is a great idea for your control room.*

# Efficiency and Reliability for Industry

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WEG's Motor Scan which works with Motion Fleet Management, WEG's Asset Management System which offers remote access to monitor the performance of motors, gears, drives, pumps, compressors and other assets. This allows for planned maintenance preventing costly downtime, more efficient use of assets and an improved total cost of ownership (TCO).

\*Visit [www.weg.net](http://www.weg.net) to learn more of the optional versions available on request and the medium / high voltage range.

Driving efficiency and sustainability



# Empowering intelligent development of gas stations

Li Yangming, chief representative of the Oil & Gas Sector, Huawei Enterprise BG, discusses the benefits of Huawei's intelligent solutions for gas stations.

**W**ITH THE RAPID development of digital technology, many retailers are exploring new technologies and devices to upgrade their gas station systems to promote oil and non-oil product sales, improve gas station efficiency, increase single station revenue, and reduce operating costs.

Complex services such as oil transportation, storage, equipment and facility management are constricted within a limited area. As a result, gas stations face the risk of fire and explosions with many security risks that are difficult to detect. For example, the concentration of oil and gas in the air cannot be directly and effectively observed, and static electricity is easily accumulated during the refuelling process, posing a serious safety risk.

Traditional gas stations rely on manual risk investigation, identification, and prevention leading to inefficiency and inaccuracy. For critical indicators such as station entry rate, refuelling rate, and repeat customer rate, dedicated personnel are appointed to manually count passing vehicles.

## Huawei Smart Gas Station Solution

Huawei's smart gas station solution uses the latest ICTs to integrate and model isolated service subsystems, such as fuel dispensers, liquid level meters, payment platforms, work orders, large screens, and video monitoring, to form a comprehensive analysis and display platform, implement around-the-clock online monitoring of oil tank inventory, fuel dispenser status, oil and gas concentrations, and gas leakages.

For example, based on AI and data analysis capabilities, the solution implements intelligent monitoring and warning throughout the eight phases of vehicle introduction, security check, security protection check, pre-unloading confirmation, oil unloading, unloading monitoring, oil acceptance, and post-unloading processing. Once a security risk occurs, the intelligent system reports the risk and alerts the manager on their mobile phone.

The AI identification accuracy of Huawei's



**Huawei's star product, FusionCube.**

smart gas station solution exceeds 98%, with risks fully identified and traceable operation records. Reliable data is used to support service management and decision making, helping gas stations go digital.

Refuelling speed, oil quality, payment experience, and the service of the gas station staff play a vital role in improving the refuelling experience. Huawei's smart gas station solution provides intelligent service functions to transform the customer's journey through digital onsite services. For example, the solution proactively guides vehicles, intelligently identifies oil product types, automatically charges fees, and proactively presents invoices, allowing consumers to refuel without getting out of their vehicles. The average refueling time is shortened from six to two minutes, optimising the refuelling experience while boosting operation efficiency.

## Huawei Fusion IT Infrastructure

Huawei has launched the first intelligently integrated and converged edge platform built based on the existing infrastructure and service applications of gas stations.

The platform is easy to operate and maintain. Using Huawei's star product FusionCube, Huawei integrates the IT

systems at gas stations such as computing, storage, network, security and AI. This allows a wide range of intelligent services and helps gas stations develop intelligent sales, digital operations and integrated management.

## Integrating existing devices

Gas stations also need innovative applications to operate and manage new services. Huawei can reuse existing gas station devices, applying an AI engine to develop and train Huawei and third-party algorithms by orchestrating resources on the cloud and at the edge. The algorithms can be remotely delivered to sites with one click. As such, service rollout takes half the time, while applications can be quickly developed and iterated. Time-sensitive services can be quickly processed directly at the gas stations. Only the processed core data is transmitted to the cloud as needed. This reduces the overall latency during data processing and requires less bandwidth for data transmission. With fewer transmission links, data is more secure.

As traditional gas stations embark on the road to a digital future, Huawei will continue to build a 'people-vehicle-life' ecosystem, to increase sales of refined oil products and deliver optimised services to customers. ■

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## Kelvin to showcase collaborative control software solutions

AT ADIPEC, KELVIN, the leading collaborative control software company delivering industrial intelligence, will showcase its innovative solutions such as Kelvin Carbon Maps and Kelvin Copilots that demonstrate how Kelvin converges industrial automation and human understanding to convert insights into actions that reduce carbon emissions.

Peter Harding, founder and CEO of Kelvin will be a part of an executive panel at the Decarbonisation Conference on day one of the event. Kelvin will also be presenting at the Innovation session on 'Achieving Net Zero Goals with Industrial Intelligence'.



Image Credit : Kelvin

Peter Harding, founder & CEO, Kelvin.

Speaking about the company's participation, he said, "The Gulf is home to some of the world's most ambitious carbon emissions goals. The region is focused on the next generation of sustainability initiatives to help advance and develop its economies. Now is the time to showcase Kelvin's cutting-edge industrial software that enables energy giants and industrial leaders to boost productivity, reduce operational costs and slash emissions."

Harding added, "The digital revolution is taking place in the energy markets right now. Kelvin is charting a new path for energy companies to achieve their sustainability goals. We plan to accelerate how companies become more sustainable and reach their net zero goals. As a company that constantly innovates, we provide the necessary tools for organisations to unlock the full potential of their teams through collaborative control."

The US-headquartered firm will demonstrate Kelvin Carbon Maps, one of the world's first industrial solutions for optimising operations to achieve emissions goals. It is a solution that connects vital data and information about production facilities, assets, and processes to engineers and operators.

Kelvin Carbon Maps provides teams with complete visualisation in a unified view of their entire operations in real-time. It seamlessly identifies bottlenecks, addresses failures, and provides the information required to take action and improve operations.

The company will also present Kelvin Copilots, a solution that enables organisations to fix problems and take action through optimised applications that improve production processes, provide prescriptive recommendations, and execute control decisions. Kelvin Copilots transform ideas about improving production into actions that achieve real impact on net zero goals.

Kelvin empowers world-class industrial intelligence and is focused on connecting companies to the next generation of industrial automation for carbon reduction and collaborative control.

"We are delighted to bring our solutions to the Middle East, to help companies prosper in the new energy age, using automation and intelligence to turn data insights into action, driving impactful decisions across organisations."

Kelvin executives will be available at their booth PC7 in Hall 17 at ADIPEC to meet existing and potential customers and partners, and share their global success stories with them.





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# Solving the challenges of lighting a refinery

Daniel San Bernardino, ZALUX business development manager for hazardous area lighting and EPC projects, discusses how the company's solutions meet the varied and challenging needs of a refinery environment.

**A**S HAZARDOUS AREAS, refineries present a challenging environment for lighting solutions. A combination of harsh environmental conditions and the need for high quality lighting to help ensure safe operation mean lighting systems need to meet stringent requirements. But what do modern lighting systems offer and what factors should operators consider when selecting luminaires to cover the varied needs of areas throughout the plant?

## The challenges of a refinery environment

Ensuring safe operation is the highest priority for ZALUX and our lighting solutions meet strict safety standards in accordance with ATEX and IECEX, as well as the most demanding of end-user specifications. They guarantee excellent performance and lighting in even the most challenging areas found throughout a refinery.

ZALUX latest technology digital LED lighting solutions meet differing location requirements and reduce maintenance overheads. They deliver energy savings, increased sustainability, resistance to chemicals and environmental elements, longer life, and easier installation and maintenance. For refineries operating 24/7 they can significantly lower ongoing energy costs and provide excellent ROI. Here's how...

## Reducing energy costs

LED technology is both sustainable and proven. It can reach remarkable levels of efficiency and performs two or even three times better than traditional technologies, equating to 50% saving in energy. With the integration of smart technologies, which ensure luminosity is at the right level when and where it is needed, a ZALUX lighting solution can net around 80% operational cost savings compared with traditional technologies.

## Ensuring great performance

By using resilient PMMA materials, ZALUX luminaires offer a lightweight, robust solution



*For refineries operating 24/7, ZALUX can significantly lower ongoing energy costs and provide excellent ROI.*

to ensure safe, easy handling and installation. They have a wide temperature operating range (> 55°C) and, for extreme temperatures, our OREx luminaire can operate in an ambient temperature of 75°C.

## Reducing installation and maintenance overheads

ZALUX LED technology offers up to 10 times longer useful life than conventional technology, significantly reducing maintenance overheads. Units can directly replace traditional fluorescent units and versatile mounting options and wireless intelligent controls further simplify installation, optimise life expectancy, and enable data collection to facilitate predictive, rather than time-based, maintenance.

“ZALUX latest digital LED lighting solutions meet differing location requirements and reduce maintenance overheads.”

## Meeting the wide and varied needs of a refinery

By selecting ZALUX, you are choosing a single vendor, registered with EPC and end users, that can meet the diverse requirements needed throughout a refinery. For example, an Ex zone 1 tank storage area outdoor luminaire must provide high quality lighting so operators can safely carry out maintenance tasks. However, it may be exposed to direct sunlight, high temperatures, wind and rain. Our PMMA profiles offer excellent chemical resistance, robust construction, and UV protection. The ZALUX STRONGEx G2 zone 1 luminaire offers a great solution to this environment.

An Ex zone 2 processing area has structures around pipeline areas and luminaires may be exposed to dust, dirt and weather. The versatile and weatherproof ZALUX ACQUEx incorporates a polycarbonate diffuser with UV protection, prismatic design for great light distribution from high ceilings, and exceptionally high efficiency for long life and reduced maintenance.

Lighting is an important safety and energy consideration for a refinery, but each installation has varied and demanding requirements. ZALUX digital LED solutions are holistically designed to provide sustainable solutions. ■

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## Next generation jack-up designs for the Middle East

THE ONGOING DEMAND for energy from all sources and an ageing infrastructure requires the continuous expansion and maintenance of the energy producing infrastructure offshore. This is also true in the Middle East region, which traditionally is an area where offshore service jack-ups have been extensively used. The evolving requirements of the local energy companies, lessons learned from operations over the past decade coupled with the need for cost efficient and more sustainable solutions led GustoMSC to the development of a new generation of its service jack-up designs, specifically tailored for Middle East offshore operations.

While the Middle-East demand is currently driving the rising jack-up market in 2022, GustoMSC made its mark in the offshore landscape of the Gulf region over the years. In the 1980's, the company

maintained for reliable operations.

The design features a draught of less than four metres to access shallow fields, combined with a reduced spudcan bearing pressure to reduce seabed indentations. At the same time, it features a water depth capability of 65 m to be able to work in a large area of the Middle East Area. With a dynamic positioning system fit for purpose for the specific environmental conditions in the Middle East and a new version of the proven GustoMSC Variable Speed Driven electrical rack & pinion jacking system, the design offers a cost efficient solution.

Next to the oil company's requirements, the need for reduced environmental impact has come to the forefront over the past decade. Benefiting from the latest developments in this field, the design features possibilities to reduce emissions.



Image Credit: GustoMSC

*GustoMSC's next generation service jack-up designs are specifically tailored for Middle East offshore operations.*

designed the first service jack-ups for the region which are still in operation; the Arabiyah offshore support jack-ups for Saudi Aramco. Since the introduction of the first unit of GustoMSC's successful NG-2500X series of jack-ups in 2009, the evolving requirements of the national oil companies, the feedback over the years from operational use, and the potential in the Middle East has allowed the introduction of GustoMSC's next generation offshore service jack-up design. This new design meets full compliance with the evolved requirements from the Middle East national oil companies and all other relevant rules and regulations, while the proven robust features of its predecessor designs with integrated jacking systems have been

Power regeneration and energy storage systems such as batteries can be incorporated, alongside various other technologies. Designed to allow construction at shipyards of choice combined with GustoMSC's experience in working with and supporting shipyards worldwide in building these specialised units also offers potential to build in the Middle East region, realising in-country value.

Altogether, GustoMSC's next generation service jack-up design offers a cost effective solution incorporating all the features to successfully operate in the Middle East. It benefits from the latest developments while building on the reliable and robust characteristics of its predecessors.

*GustoMSC will fully introduce the latest service jack-up design during ADIPEC 2022.*

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# Accelerating innovation requires universal access

James Patton, principal – business development for energy & utilities at Amazon Web Services (AWS), discusses how enabling global access to the OSDU Data Platform is accelerating innovation – regardless of cloud knowledge or location.

*The AWS and IBM OSDU Data Platform solution enables universal access and a seamless experience across an OSDU instance.*

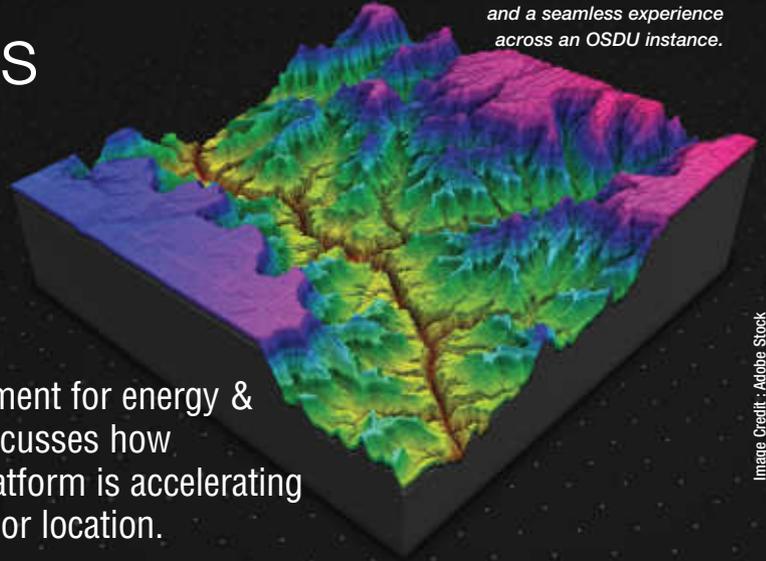


Image Credit: Adobe Stock

**L**EVERAGING THE LATEST advances in digital transformation allows organisations across the energy industry to achieve new levels of performance and efficiency. Doing so, however, is contingent upon an organisation's ability to effectively manage, maximise and access the value of data.

Data management is a pervasive challenge that the industry has sought to overcome for the last two decades, and more recently has been exacerbated by the significant growth of data sets and increasing complexity of workflows. Siloed by domains and applications, and hampered by residency restrictions, energy data sets can be difficult and time-consuming to find, costly to transfer, and underutilised due to these accessibility restrictions.

To address the industry's data management challenge, eight founding members (including Shell and AWS) set up an industry collaboration with help from The Open Group, a global consortium that enables the achievement of business objectives through technology standards.

The Open Group OSDU Forum started collaborating in 2018 on building the OSDU Energy Data Platform with the aim of developing an open source, standards-based, technology agnostic data platform for the energy industry that stimulates innovation, industrialises data management, and reduces time to market for innovative solutions. The OSDU Data Platform was developed to overcome barriers to innovation that are caused by data silos, and empower organisations and independent software vendors of all sizes to leverage data to build transformational workflows. The AWS implementation of the OSDU Data Platform is

backed by a cloud-native infrastructure that is built for the cloud.

While many organisations across the industry are making significant strides towards implementing and integrating their own instances of the OSDU Data Platform, limited connectivity to a cloud and data residency restrictions continue to present significant barriers to access. Data residency refers to the requirement that specific data types considered material to a nation's growth, such as subsurface and production data, must remain within that nation's geological boundaries. When no cloud footprint exists within that country's borders, it presents a key barrier to utilising modern cloud services.

## Enabling global access

To overcome data residency and cloud access challenges, AWS and IBM pioneered an enterprise-grade joint solution to develop an OSDU Data Platform instance that leverages IBM's hybrid cloud, software based on Red Hat OpenShift technology. This solution meets data residency and on-premises needs, and enables universal access and a seamless experience across an OSDU instance, including access to AWS cloud infrastructure services for applications or intensive workloads, while also delivering a transparent experience across practically any on-premises IT infrastructure.

The OSDU Data Platform provides a set of data standards and service application programming interfaces (APIs) that enable application integration, in addition to fast and high-fidelity data sharing. This application interoperability ensures that organisations can leverage the benefits of the OSDU Data Platform, while also having the ability to

integrate innovative proprietary and third-party solutions.

The AWS and IBM OSDU Data Platform solution enables an organisation to access cloud-based data on-prem, which is needed to fully understand the context of data products from its assets external to the residency-restricted location. Organisations with data residency restrictions could also share on-prem metadata to their global register, which means metadata can be shared without exposing sensitive raw data-sets. The solution also provides temporary cloud-based storage for analytics, machine learning, and/or high-performance computing.

This setup facilitates data-sets to be utilised on the cloud for modern services not available on-prem at scale, but persisting the derivative data-sets on-prem with no persistent data remaining on the cloud. Doing so ensures that organisations can continue utilising innovative proprietary and third-party solutions and also have access to cloud-based transformational technologies such as artificial intelligence and machine learning.

Specifically focused on reducing barriers to adoption, the AWS and IBM collaboration provides a proprietary on-premises and cloud deployment of the OSDU Data Platform that can be accessed globally, and deliver effective data management capabilities that help organisations reduce cost, time and resources required to derive actionable insights from data. To date, more than 20 energy operators globally across 28 different assets are leveraging the AWS and IBM technologies, proving that global access to the OSDU Data Platform – irrespective of location or previous cloud experience – is key to unlocking innovation across the whole energy industry. ■



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## Teledyne FLIR to demonstrate gas detection and monitoring solutions at ADIPEC

TELEDYNE FLIR, A world leader in gas detection and monitoring technologies, will present its newest products and innovative solutions for gas detection and monitoring from booth 11600 in Hall 11.

Teledyne products and solutions help survey facilities faster, troubleshoot failures, target the source of leaks, maintain regulatory compliance and help inspectors, managers, and technicians around the world solve problems quickly and avoid expensive shutdowns

FLIR optical gas imaging (OGI) cameras are used throughout the oil and gas industry to detect methane and other hydrocarbon emissions from the extraction, transmission, and processing of petroleum and natural gas. These cameras visualise hundreds of invisible gases, allowing inspectors, engineers, and maintenance crews to identify leaks safely without having to shut down critical systems.

At the booth, the FLIR GFx320 will be displayed, representing ground-breaking technology for visualising fugitive hydrocarbon leaks at natural gas well sites, offshore platforms, LNG terminals, and more. Its certifications for use in hazardous locations allow surveyors to work confidently while maintaining safety.

In the spotlight will also be the FLIR GF77, a ground-breaking uncooled optical gas imaging camera with interchangeable lens options that detect methane, sulphur hexafluoride (SF6), ethylene, ammonia, and other gas emissions. Capable of both gas detection and radiometric temperature measurement for thermal inspections, the GF77 is ideal for electric power utilities, oil and natural gas operations, chemical/manufacturing facilities, the food and agriculture industry, and first responders.

Also to be showcased are the FLIR T-Series thermal cameras for efficient condition monitoring which offer the flexibility, precision and features needed to inspect equipment safely and prevent breakdowns. This includes the T865, T518 and T1020 (service Demo).

ADIPEC visitors will also be able to view a range of Extech products including the RH250W, a compact hygro-thermometer and the AN250W, a compact airflow meter with Bluetooth connectivity, which allows building and maintenance professionals to view and share relative humidity, air velocity and temperature data directly from a mobile device using the free ExView app. Others in the range include LT250W, SL250W, RPM250W, HDV640W and many more.

Visitors will also have the opportunity to view the Teledyne FLIR test and measure products such as clamp meters, multimeters, moisture meters, IR thermometers and IR windows.



OGI cameras can be used to detect methane and other hydrocarbon emissions.

Image credit: Teledyne FLIR

## TWMA brings proven low-carbon solutions to ADIPEC

SPECIALIST DRILLING WASTE management company, TWMA, will highlight how its RotoMill wellsite processing solution has been proven to reduce the carbon emissions of drilling operations by 50% at this year's ADIPEC Exhibition and Conference.

Aligned to this year's ADIPEC theme of unlocking sustainable technologies for the energy future, the world's drilling waste specialist will showcase how its solutions lower cost, deliver operational efficiencies and reduce the carbon emissions of drilling operations around the world.

TWMA will also showcase its recently launched XLink real-time monitoring and automation technologies, designed to provide operators with increased deeper drilling insights, and real time data



Gareth Innes, chief engineering and commercial officer for TWMA.

Image credit: TWMA

monitoring to improve the efficiency of their wellsite drill cuttings processing system.

Chief engineering and commercial officer, Gareth Innes, said, "Over the past decade, we have delivered low cost and sustainable solutions for some of the UAE's most ground-breaking projects, demonstrating the value a properly engineered drilling waste management solution brings.

"The UAE is a key market for our business, and ADIPEC offers a fantastic platform to discuss industry challenges and share best practice. As the industry remains focused on driving sustainability, we look forward to showing how we can support low carbon emission strategies at the conference."

At the show for the seventh year, TWMA is exhibiting in Hall 8, Stand 8410. Specialists from its global team will run a series of technical presentations during the conference.

## Coretrax to showcase well integrity solutions

CORETRAX, LEADING EXPERT in well integrity and production optimisation, is exhibiting at ADIPEC following its continued growth in the Middle East. With increasing activity in the region, following a renewed interest in energy security and the ongoing need for oil and gas production, the region presents a key opportunity for the company.

During ADIPEC 2022, Coretrax, which is celebrating 13 years of supporting the oil and gas industry in the Middle East and delivering efficiencies across the market, is exhibiting on stand 6331, showcasing a variety of its different wellbore clean-up solutions, downhole technologies, plug and abandonment and expandable tubular products.

Nicholas Kjaer, eastern hemisphere president at Coretrax, commented, "ADIPEC is a great event to bring the industry together as we look to the future. With our team working with clients in the Middle East and beyond, we are pleased to be able to showcase how we can deliver rig time savings across the industry at events like these."

Recently, a major Middle East operator asked Coretrax to deliver its Activated Drilling Scraper (ADS), which remains dormant in the string until needed, to allow drilling operations and liner hanger preparation to be completed in a single trip. The system has been deployed in the United Arab Emirates in an ongoing drilling campaign.

They will also present a paper alongside ADNOC on *Drilling To The Limits. A Step Change In Drilling Operations By Utilizing Innovative Drilling Scrapers Technology Tools To Optimize The Drilling Performance With Low Risk And Saves 1.5 Rig Days Per Well In UAE Onshore Field.*



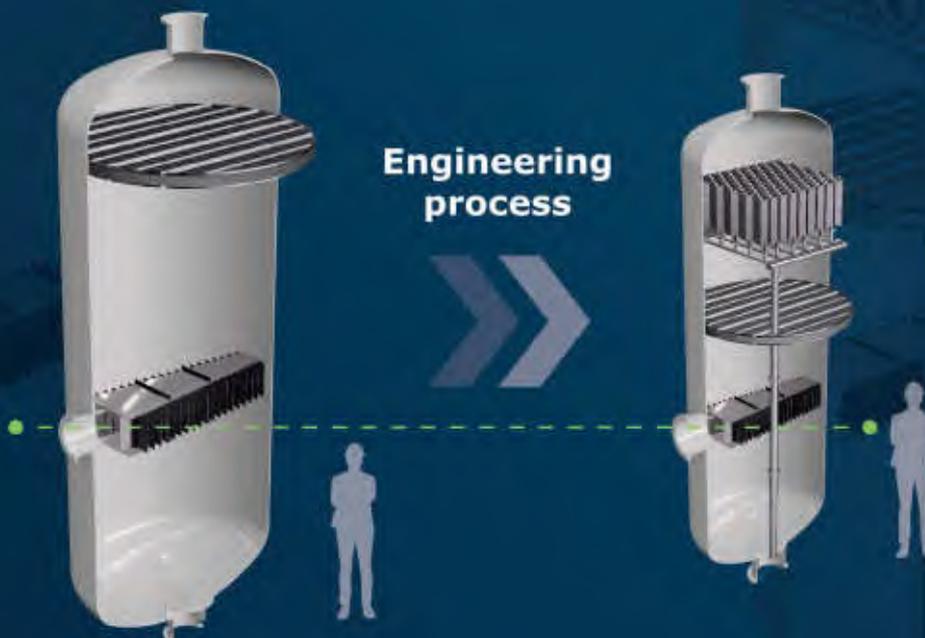
Coretrax will demonstrate how it can deliver rig time savings.

Image credit: Adobe Stock

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- VESSEL SIZE AND WEIGHT
- STEEL CONSUMPTION



## Emerson to showcase the latest technologies for sustainable operations

UNDER THE THEME 'Innovation that Accelerates Sustainability', Emerson will be showcasing the latest technologies that help companies improve their capital projects and operational performance that can contribute to more sustainable operations.

"Our technology showcased this year focuses on four interest areas: Energy Efficiency, Operational Excellence, Emissions Reduction and Decarbonisation," explained Widad Haddad, vice president & general manager, United Arab Emirates, Oman, Yemen & Lebanon, Emerson Automation Solutions.

"In addition, Emerson is putting a spotlight on its capabilities in the Middle East and Africa region around local manufacturing and service support, as well as programmes and initiatives that are aimed at supporting local talent while fostering diversity, equity, and inclusion as a key element of our culture in Middle East and Africa.

"ADIPEC being the world's most influential gathering for energy industry professionals, allows participants to connect with and meet industry leaders and decision makers from across the globe that have visions aligned with ours.

"We believe that with the direction the world is moving towards, this year's exhibition will present a great opportunity to feature state-of-the-art technologies that will help our customers achieve their decarbonisation targets.

"Emerson will also be promoting the vision of its leadership and other stakeholders to ensure a more sustainable future."

Turning to prospects for Emerson in the Middle East, Haddad commented, "The Middle East & Africa region has been a strong growth area for Emerson over the past decade, and we expect this growth to continue. There is strong investment momentum in several industries such as hydrocarbons, power & water, and emerging growth in the hydrogen space. Emerson's wide portfolio of automation technologies and strong footprint across Middle East & Africa market uniquely positions us to support our customers, develop these projects and manage them through the lifecycle of their operations."



**Widad Haddad, vice president & general manager, United Arab Emirates, Oman, Yemen & Lebanon, Emerson Automation Solutions.**

Image credit: Emerson Automation Solutions

## Fugro to showcase remote and autonomous solutions

FUGRO WILL PRESENT its cutting-edge remote and autonomous solutions this year at ADIPEC.

"Visitors to the Fugro stand (No. 432, Hall 4) will have the opportunity to step inside our Remote Operations Center (ROC) and watch the region's first Uncrewed Surface Vessel (USV) be operated live from the booth," said Hennes Siegers, director IRM services & remote operations, Fugro.

"These remote solutions are enabling our clients to achieve net zero carbon emissions and conduct safer, more efficient offshore operations, to develop sustainable infrastructure and strengthen climate resilience.



**Hannes Siegers, director IRM services & remote operations, Fugro.**

Image credit: Fugro

## IFS to demonstrate solutions for asset optimisation

IFS, THE GLOBAL cloud enterprise software company, will showcase its latest innovations in Hall 14 at ADIPEC, and demonstrate how it helps energy companies optimise assets and gain better control of projects globally as they chart out new paths through diversification.

"Embracing the use of technology to inform and support decision making enables organisations to achieve operational excellence. IFS software supports all the business-critical processes that facilitate an energy organisation to digitally transform their operations across different assets to deliver business value in an evolving market. ADIPEC is a perfect opportunity for us to demonstrate our capabilities to this very vibrant sector," said Mehmood Khan, managing director for the Middle East and North Africa at IFS.

IFS has been supporting customers such as BW Energy, Borr Drilling, SBM Offshore, ARO Drilling, Kodiak Gas Services and many other O&G customers across the globe to accelerate digital transformation and sustain growth. These solutions support mission-critical business processes including enterprise asset management (EAM), maintenance, onshore-offshore data replication, supply chain management, human capital management, financials, document management, etc, which simplifies work processes and offers higher efficiency and project profitability. Additionally, IFS Cloud enhances cross-functional business operations that helps customers receive a clear view of all assets and enhances customer engagement, enables AI powered self-service and the use of AI-powered scheduling.



**Mehmood Khan, managing director for the Middle East and North Africa at IFS.**

Image credit: IFS

"ADIPEC will give Fugro experts the opportunity to meet new and existing clients to share insights on our net-zero unmanned vessels for offshore survey and inspection, along with real-time data delivery portals, touchless subsea vision technologies, and high-speed hydrography solutions. "

Commenting on prospects for Fugro in the Middle East, Siegers added, "Fugro has supported the energy sector in the Middle East for several decades and has strong relationships with the national operators. With an industry-wide drive for sustainability and digitalisation backed by significant investment programmes, the region offers excellent business prospects.

"Fugro is perfectly positioned to deliver transformative solutions to its clients as a technology partner to meet short and long-term goals. Technology such as our Uncrewed Survey Vessels will support the energy sector in achieving net-zero emissions by 2050."



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# Connecting systems to achieve net-zero objectives

Albert Devadasan, EVP – Energy & Sustainability at Yokogawa Middle East & Africa, discusses the company’s hydrogen and decarbonisation initiatives, and how it is helping companies to build smart, sustainable and resilient industrial ecosystems.

## What do you think is the potential for hydrogen development in the Middle East?

We can see that global energy transition is being led by countries in the region. Environmental, Social and Governance factors are priorities by not only for Government entities, but for private industries and companies as well. Considering its significant solar energy with very high GHI (Global Horizontal Irradiance), combined with wind resources, countries in the region are aiming at increasing the share of solar and wind power in their electricity generating capacity. While all countries are working towards their net-zero goals, green hydrogen is becoming an increasingly attractive option. There is a large number of green hydrogen/ammonia projects in progress in the region, and therefore, the region is well positioned to be a major supplier of green energy to the world.

With long history and experience in the entire value chain from renewable power production to ammonia production and transportation, Yokogawa will continue to support these initiatives and supply solutions using emerging and future technologies for the development of a truly autonomous operation model.



Image Credit: Adobe Stock

*Yokogawa has long experience in the hydrogen value chain.*

## What role is Yokogawa playing globally in hydrogen development, and are there any projects/initiatives you would like to highlight?

We have good experience working on renewable and electrolysis projects globally.

As for hydrogen, in preparation for the coming of a hydrogen society, we have set up a project team that is examining the entire industry to identify the value that our company can provide throughout the hydrogen supply chain, including the production and transportation of hydrogen. Yokogawa participates in the Energy Transition Campus Amsterdam (ETCA). In addition, we participate in the Clean Fuel Ammonia Association, the Kawasaki Carbon Neutral Complex Formation Promotion Council, and the Kawasaki Port Carbon Neutral Port Formation Promotion Council in Japan.

## How are you helping companies to achieve their decarbonisation objectives through carbon capture and carbon management solutions?

By cooperating with partners across multiple industries, Yokogawa is aiming to achieve net-zero CO<sub>2</sub> emissions and contribute to the achievement of a carbon-neutral society that is one of the company's "Three goals" for sustainability.

We have implemented our systems and services in CCUS projects in several regions. Regarding carbon neutrality, control, which is directly linked to operations, plays a major role, and the collaborative study project for the achievement of carbon neutrality at an industrial complex in the Goi district of Ichihara City in Chiba Prefecture, Japan, for example, is seen as a touchstone. We are currently conducting an inter-industry survey

“By cooperating with partners across multiple industries, Yokogawa is aiming to achieve net-zero CO<sub>2</sub> emissions and contribute to the achievement of a carbon-neutral society.”



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to achieve net-zero CO<sub>2</sub> emissions from the entire complex in the district in 2050.

In the future, it is important to create an SoS (System of Systems) that looks at the entire supply chain, including production, supply, and use, within that region. To handle this properly requires not only IT know-how but also on-site knowledge of operational technology (OT). Yokogawa is well versed in the control of the process industry, and believes that our company can deliver value.

### How important is digital transformation for achieving efficiency and sustainability objectives?

Our company's purpose states, "By utilising our ability to measure and connect, we fulfill our responsibilities for the future of our planet."

"Connect" means not only connecting valuable information, but also to build trust with customers in various industries, and to further resonate value by becoming a unifying point and connecting customers and industries.

The supply stability of renewable raw materials, biomass power generation and waste heat utilisation is a challenge, and control is difficult. We will continue to help our customers decarbonise by solving this challenge, while leveraging our DX and consulting capabilities in digital twins, solutions, simulation, and AI.

We believe that the energy supply chain



Image Credit: Yokogawa Middle East & Africa.

**Albert Devadasan, EVP – Energy & Sustainability at Yokogawa Middle East & Africa.**

will become increasingly complex, shifting from centralised production to decentralisation

and overall optimisation. For example, instead of being supplied with electricity by a large power plant, the system will change to combine multiple renewable energy sources and optimise them. Looking ahead to a world where society as a whole is a System of Systems (SoS) that organically connects systems and systems, Yokogawa will lead the way by leveraging its consulting and integration capabilities.

### What is the focus of Yokogawa's participation at ADIPEC, and what will you be showcasing?

The synergistic multi-disciplinary forum of global experts and decision makers that ADIPEC engages has been an ideal and impactful platform for Yokogawa.

This year, Yokogawa will be joining the Digitalisation Zone of ADIPEC 2022 that brings together energy and technology companies to build smart, sustainable, and resilient industrial ecosystems. In keeping with this emergent focus, Yokogawa, along with Group company KBC and our partner Ex-Robotics, will showcase Industrial Autonomy solutions which harness our IT/OT expertise to guide companies along the continuum of Industrial Automation to Industrial Autonomy (IA2IA).

You will also see a 3D model of "containerised hydrogen" in our booth, that has already gained significant attention of our customers in the region. ■

## Managing data is crucial for digitalisation success

THE OIL AND gas sector faces many challenges, including upskilling the workforce, increasing capital and operational costs, a complex and ageing infrastructure, market volatility as the new norm, and growing sustainability commitments. Wherever operators are on their digital journey, Rockwell Automation has a solution at ADIPEC.

Operators can leverage technology for a safer workplace and improved productivity by utilising knowledge transfer and clear instructions with connected worker solutions, ensuring staff are trained, productive and secure.

With effective maintenance strategies using predictive maintenance to reduce costs, operators can ensure reliable operations and assets, and improve asset utilisation and availability to improve bottom-line performance. Using information solution tools to connect and optimise processes, operators can improve production



Image Credit: Adobe Stock

*Data is critical for the optimisation of processes.*

and reduce inefficiency from the reservoir through to the refinery. In a volatile market, utilising digitalisation that drives automated operations allows operators to be opportunistic with scalable processes that rely less on human capital.

With sustainability emerging as a

key priority across the industry, digital transformation will be vital in helping organisations unlock real value in a decarbonised future.

Crucial to all these endeavours is data. On its stand (Hall 13, Stand 13455) at ADIPEC 2022, Rockwell Automation will partner with Sensia,

showcasing solutions that enable customers to decarbonise their operations in onshore and offshore production, increase their overall operational effectiveness, overcome market volatility, and meet their ESG and sustainability goals using digital transformation.

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# Showcasing innovative and sustainable technology

As the countdown begins to COP28 next year in the UAE, Kanoo Energy, a division of Kanoo Industrial & Energy, will be participating in the 18th edition of ADIPEC, taking place from October 31 to November 3, 2022. Innovative solutions related to the oil, gas and petrochemical industry will be showcased.

**K**ANOO ENERGY WILL be at the annual Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) 2022, showcasing a range of sustainable technological innovations that are accelerating the growing demand for energy transition.

Participating at Stand 12330 in Hall 12, this year the visitors will witness Kanoo Energy's collaborative offerings divided into Industrial and Technology categories. The Technology section of the stand will display state-of-the-art technology solutions.

The Kanoo Energy stand will have for the first time a mini theatre setup to display technical presentations by participating companies. The sessions will provide enriching industry insights, challenges, and market disruptions that will be at the heart of the global dialogue on the future of energy. The stand will also amplify the achievements and futuristic direction adopted by Kanoo Energy and its partners via a giant screen.

More than 150,000 professionals and corporate representatives will be visiting over the four days of the event. Hosted by the Abu Dhabi National Oil Company (ADNOC) in the capital of the United Arab Emirates, ADIPEC is the world's most influential meeting place where oil, gas and energy companies and professionals convene in-person, safely and securely.

Commenting on the participation, Ali Abdulla Kanoo, President of Kanoo Industrial & Energy said, "For over decades now, ADIPEC remains a very important platform and a great initiative from ADNOC. It is a great arrangement to bring together global industry leaders from around the world. With our participation at ADIPEC 2022, Kanoo Energy strengthens our commitment to align with the UAE vision to pioneer a new era of technology development in the future of energy.

"When you have initiatives such as COP27 and COP28 lining up on the world stage, coming together for ADIPEC only helps as a vital support system. For us at Kanoo Energy,



Image Credit : Kanoo Energy

**Kanoo Energy is a leading engineering service provider to core sector industries across Saudi Arabia, UAE, Bahrain and Oman.**

it has always been about innovations through collaborations. Over the four days in Abu Dhabi, we will showcase existing and new solutions, create business opportunities as well as strengthen our relationships and network across the whole energy sector."

Manoj Tripathy, Chief Executive Officer of Kanoo Industrial & Energy, said, "We are

contributing towards building national capacities in energy technologies. This involves Kanoo Energy investing into renewable energy, gas-fired power solutions, the Internet of Things (IoT), using Artificial Intelligence in an energy production unit, 3D printing, and additive manufacturing, etc."

The Yusuf Bin Ahmed Kanoo Group is one of the oldest & largest family-owned independent groups of companies with varied interests. Kanoo Energy, a subsidiary, was established over two decades ago and is a leading engineering service provider to core sector industries – oil & gas, power, utility, mining and construction, among others – across Saudi Arabia, UAE, Bahrain, and Oman. ■

“ For us at Kanoo Energy, it has always been about innovations through collaborations.”

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### 1 SOURCE THOUSANDS OF PRODUCTS AND SERVICES

Attracting more than 2,200 exhibiting companies and 54 NOCs, IOCs, NECs and IECs from around the world, ADIPEC provides an unrivalled opportunity for buyers and sellers to meet, learn, network, do business and source of thousands of products, services, technologies, innovations and new age energy solutions across the full value chain.

### 2 SPECIALISED INDUSTRY ZONES

Running in parallel, ADIPEC will host four specialised industry zones - Offshore & Marine Zone, Digitalisation In Energy Zone, Smart Manufacturing Zone and the newly launched Decarbonisation Zone, that will provide a platform for new business opportunities across the full spectrum of the energy industry.

### 3 INTERNATIONAL PERSPECTIVE

With more than 28 exhibiting international pavilions, ADIPEC provides a platform to energy industry professionals to convene and explore latest developments within the global energy ecosystem.

### 4 NETWORK WITH THE RIGHT AUDIENCE

ADIPEC provides an exceptional opportunity to the global energy industry to convene and network with the right audience. 80% of the 150,000 energy professionals convening from over 160 countries are either a decision maker, purchaser or an influencer.

### 5 JOIN THE CONVERSATION TOWARDS ENERGY TRANSITION

ADIPEC 2022 is facilitating important discussions and will continue to provide a global platform to the energy industry by attracting credible players and advance an equitable and responsible energy transition – one that is flexible and resilient.

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# Walking to work in the Gulf

Ampelmann's W2W solutions provide safe and reliable access during offshore operations.

**T**HE LAST TWO decades have seen tremendous changes in the offshore service sector. The introduction of Walk to Work (W2W) has permanently changed the nature of the global offshore energy infrastructure. In just 15 years, Ampelmann, one of the early pioneers of W2W, has grown from a small engineering start-up based in the Netherlands, to an international company with a large fleet operating in all corners of the world. Known globally for its motion compensated gangways, the company's systems have made marked strides everywhere and see continuous use throughout the world.

Fast becoming the new industry standard, W2W has much to offer to the Gulf. As the region contains the largest offshore hydrocarbon reserves in the world, the exploration, production and maintenance of offshore assets is growing consistently with the rising demands for energy. Ampelmann's marine based W2W solutions are cost-effective and provide safe and reliable access during offshore operations, offering a powerful alternative to traditional access solutions.

Sea conditions in and around the Gulf can be surprisingly harsh at certain times of the year. During the winter months, some parts of the region frequently experience rough seas and strong winds. As motion-compensated gangways remain stable during offshore operations, they can operate throughout the year and provide safe and consistent access to offshore installations in spite of seasonal constraints. By reducing the time vessels cannot transfer personnel due to bad weather, W2W solutions extends weather windows and shortens the duration of campaigns, resulting in higher operational efficiency and year-round productivity.

W2W is ideally positioned in the Gulf as the safest and most cost-effective offshore access solution that simultaneously provides consistency and high workability. By enabling continuous access throughout the year, W2W offers significant advantages over traditional access methodologies due to the motion compensated technology that underpins it.



*The Ampelmann A-type gangway in use.*

Ampelmann's gangways come in many sizes and shapes and are specifically tailored to meet the evolving demands of its clients. W2W solutions provide effective operational support throughout the entire lifecycle of offshore assets. Since its first operation in the Gulf over twelve years ago, the company has successfully supported a large variety of short and long-term work scopes, ranging from general operations, such as crew change and maintenance, to installations, shutdowns and decommissioning work.

“W2W is a key area of growth for the offshore energy sector in the Gulf region.”

Ampelmann prides itself on its innovative spirit and is building and designing new electric systems that contribute to the development of sustainable solutions and suit

the specific needs of its clients in the Middle East. The company has already begun to electrify the entire A-type fleet, which will lead to a future energy saving of 90%. Alongside the electrification of its most popular system, the company recently introduced the F-type, an electric modular system that is particularly well suited for maritime conditions such as those in the Gulf. Its 21m height-adjustable gangway allows for continuous crew change and increased operational flexibility at low cost. New electric systems, such as these, promise that W2W will remain an appealing access solution for the foreseeable future.

Deeply involved in the regional market, Ampelmann has offices in Qatar and Dubai. Its A- and L-type gangways have already transferred more than 1,200,000 people for national and international clients in Qatar, Dubai, Oman, Saudi Arabia and Azerbaijan, and more recently in Abu Dhabi. This strong regional presence allows the company to deploy and mobilise its systems at short notice, whenever and wherever they are needed. It is evident that W2W is a key area of growth for the offshore energy sector in the Gulf region. ■

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# Powering oil & gas through the energy transition

Jim Smith, business development manager, Middle East Projects, Aggreko, outlines the company's four-phase approach to decarbonising oil and gas projects.

**T**HE ENERGY TRANSITION can be a source of angst for oil and gas producers, but it doesn't have to be a cause for concern – at least not in every context. In fact, when it comes to powering oil and gas production assets, which are typically reliant on diesel power generation, developments driven by the transition can be a boon to the balance sheet.

What is more, these benefits can be achieved with incremental investment, and do not necessarily require significant capital investment. This can help ease the strain on stakeholder temperaments and Opex and Capex budgets alike.

Our four-phase approach to decarbonising oil and gas projects progresses from efficiency maximisation, through transitioning to gas, and introducing renewables.

## Step 1: Optimise

The process starts with small but mighty changes in a producer's power generation set-up. In fact, it is not even necessary to switch away from diesel to start seeing major gains. Within this step, there are three non-exclusive ways to improve efficiency and reduce emissions while saving money.

The first is 'rightsizing'. In many hydrocarbon production scenarios, generators are intentionally oversized to make sure they can cope with motor starts and high load periods. The result is that they often run at less than 30% load – an expensive and inefficient way to guarantee uptime. However, modern solutions can nudge that figure as high as 80% without compromising reliability or uptime, saving on fuel and emissions.

One technique is 'mechanical rightsizing', which involves coupling a smaller generator with flywheel technology. The flywheel system delivers high-power energy during increasing load steps by deploying excess energy captured during decreasing load steps. Similarly, energy storage technology achieves a similar end with a smart battery hybrid solution – at very low loads the battery can even handle the power output entirely, allowing generators to shut off completely for



Image Credit: Adobe Stock

*Diesel generators are widely used in the oil and gas industry.*

a period, increasing efficiency.

Alongside rightsizing, 'load-on-demand' solutions can be extremely effective at driving efficiency. This is a modular approach, whereby one large generator is replaced by a cluster of smaller generators that can automatically power up or down depending on load requirements. For example, in a scenario where a peak output of 1,500 kVA is needed, three 500 kVA generators can replace a single 1,500 kVA generator. When full capacity is required, all three can run at full capacity, but at other times, one or two of the generators can be switched off, saving fuel, emissions and noise pollution.

Finally, supplementary technology can be installed on generators to reduce emissions directly. By attaching a selective catalyst reducer and an oxidation catalyst to generators, up to 99% of controlled emissions can be cleaned, helping to reduce carbon footprint even further.

Deploying one, two or all three of these

approaches can slash emissions and fuel costs versus business-as-usual approaches, without even thinking about switching fuel.

## Step 2: Mix

Of course, fuel switching is a powerful way to reduce emissions. Natural gas emits up to 40% less CO<sub>2</sub>, 80% less NO<sub>x</sub>, and 99% less SO<sub>2</sub> than diesel, meaning a lower carbon footprint and reduced air pollution locally. Once a producer has reduced emissions from existing infrastructure as much as possible, the logical next step is to look into gas.

In the past, this was a fairly daunting thing to do – more of a leap than a step. Switching to gas might have involved connecting to or building new gas infrastructure as well as upgrading gensets. However, by breaking down the transition into smaller steps, this process can become more gradual and manageable.

Associated petroleum gases are a golden opportunity in this regard. Traditionally these are vented or flared – it is seen as too

complex and expensive to utilise this resource for powering operations. However, the economic scales have been tipped by rising diesel prices, stricter flaring, venting and emissions regulations, and falling costs for associated technology.

Now, expert engineers can survey a producer's site to identify where gas can best and most easily be captured. Then, the gas can either be piped around the site with small-scale gas distribution infrastructure or converted to power and distributed into the site's microgrid.

Crucially, this approach does not require wholesale switching out of diesel generators to work. Limited volumes of gas can be blended with diesel to incrementally reduce fuel costs and emissions according to the producer's specific economic requirements.

### Step 3: Switch

Once a producer is satisfied with a blended gas-diesel approach, it can begin to consider fully transitioning to gas at a time of its own choosing. For instance, producers often find that some of their sites do not produce enough gas to switch fully, while others produce a surplus. A simple solution, if economically feasible, is to link the sites with

gas distribution infrastructure.

That is not the only solution, however. Virtual pipelines may well prove to be a key enabler for the energy transition, and allow gas to be easily and cost-effectively transported by road and rail in the same way as diesel, allowing producers to move their own gas between sites, or simply buy it in the exact same manner as they do with diesel. The breakthrough in this process has been cost-effective equipment for capturing and converting gas to LNG at source for transportation, as well as re-gasification equipment at the other end.

Of course, in the fortunate scenario where the producer still holds an excess of gas after fully transitioning their own power requirements, there is then an economic opportunity in the surplus. The gas can be sold via virtual pipeline to power-hungry operations such as mines, data centres and even cryptocurrency mining businesses. Alternatively, it can be converted to power and sold directly into local grids when appropriate.

### Step 4: Supplement

In any conversation about the energy transition, renewables need to come in somewhere, and oil and gas production is no

exception. This is the final step, although it can actually be made anytime, complementary as it is to the others.

Hybridising generation systems to include traditional and renewable sources (plus batteries) means that the transition can be made incrementally. Battery and energy storage systems give greater power quality and resilience, while also improving efficiency and saving fuel consumption and emissions.

Typically, this set-up involves adding solar (although wind is also a possibility for some) and batteries to a traditional gas or diesel generator. Solar can power operations during bright periods and store excess in the battery for use in darker ones. The generator is there to pick up any slack or deal with peak loads, but maximum fuel and emissions savings are made by using the solar and batteries whenever possible.

A good time to consider renewable and storage investments is when existing pieces of equipment need to be replaced, rather than replacing like-for-like. This allows you to start using renewable energy without impacting your operations – and any excess gas that the renewables displace can be converted to power and sold to the grid for extra revenue. ■

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**T**HE GAMMAPILOT FMG50 compact transmitter is designed for non-contact point level detection, continuous level, interface and density measurement in liquids, solids, suspensions, or sludges. As the first true two-wire loop powered compact transmitter it minimises engineering and installation efforts.

### Fields of application

The Gammapiilot FMG50 scores where other measuring principles reach their limits, in terms of high temperature, high pressure, corrosion, abrasion, viscosity, or toxicity. Without contact to the medium, the Gammapiilot reliably measures from the outside through the walls of all kinds of process vessels such as reactors, autoclaves, separators, acid tanks or cyclones.

### Technical data

- 4...20mA HART two-wire technology
- Developed according to IEC 61508 for SIL2 and SIL3 for all measuring tasks (level, point level, density, interface, and concentration measurement)
- Heartbeat Technology
- Ambient temperature range: -40°C up to +80°C (-40°F up to +176°F)
- Bluetooth wireless technology

### Benefits at a glance

- Savings in engineering and installation thanks to innovative two-wire technology
- Maximum safety, efficiency, and availability due to development according to IEC 61508 for SIL2 and SIL3 in homogeneous redundancy
- Heartbeat Technology Verification uses constantly running diagnostic routines to verify the correct functioning of the device without process interruption

“The Gammapiilot FMG50 scores where other measuring principles reach their limits.”

- Heartbeat Technology Monitoring provides relevant data for predictive maintenance
- Heartbeat Technology Diagnostics guarantees the safe plant operation with longer proof test cycles thanks to permanent device diagnostics
- Innovative sensor technology for the use without additional water cooling ensures reduced installation and operating costs



Image Credit: Endress+Hauser

The Gammapiilot FMG50 compact transmitter.



The Gammapiilot reliably measures from the outside through the walls of all kinds of process vessels.

Image Credit: Endress+Hauser

- Bluetooth wireless technology for easy operation out of the radiation beam
- Intuitive user interface with guided wizards for: Commissioning, SIL Locking, SIL Proof test, Heartbeat Technology Verification, Heartbeat Technology Monitoring

The Gammapiilot FMG50 fits into a wide range of applications. Endress+Hauser is the pioneer in radiometric technology with over 50 years' experience researching how to optimise the measuring principle to solve every extreme measuring task. With its compactness and safety, the new Gammapiilot surpasses previous radiometric measuring instruments, solving all measuring tasks in one device. ■

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# Pressure transmitters with mathematical compensation

Keller AG has redefined the state-of-the-art in high precision pressure measurement technology with its Series 33 X and 35 X pressure transmitters.



The Series 35 X and Series 33 X pressure transmitters.



Level gauge 36 X W.

Image Credit : Keller AG

**A** FLOATING MEASUREMENT cell, totally digital signal processing, compensation with mathematical accuracy and a highly dynamic microprocessor – these assets produce reference accuracies of up to 0.05%FS error bandwidth.

The floating piezoresistive sensor element is free of outside influence from mechanical and thermal forces at the pressure connection. The A/D converter in the signal processor operates with a resolution of 16 bits (0.002 %FS), using the signals from the pressure sensor and the integrated temperature sensor to calculate accurate compensated measurement values in just a few milliseconds.

The transmitter's analogue output is updated at least 400 times per second, with overall accuracy of 0.05%FS (including temperature influence in the 10 °C...40 °C range). As an option, precision of 0.01%FS in the same temperature range is available, in relation to the reference values of primary standards (accuracy: 0.025%).

In the typical process temperature range of -10 °C...+80 °C (an interval of 90 degrees

Kelvin), our 33 X and 35 X pressure transmitters supply their digital measured values with a total error band of 0.1%FS. The digital output permits functions such as direct display of measured pressure values on a laptop or PC, and serial networking for up to 128 transmitters. Depending on the plug type and the number of contacts available, the transmitters provide a digital output (RS485) as well as an analogue current or voltage output, e.g. 0...10 V (3-wire); 4...20 mA (2-wire).

“ The transmitter's analogue output is updated at least 400 times per second.”

Measurement ranges between 0.8 bar and 1000 bar can be supplied for absolute, gauge, and differential pressures. High overpressure measurements, depending on the structural design. The pressure port can be a threaded

connection 33 X, or a front-flush diaphragm 35 X. Thanks to the digital interface (RS485), the analogue signal span and zero can be adjusted across the whole of basic measurement range, to suit specific applications.

Two PC programmes are available free of charge for Series 30 X precision transmitters: PROG30 is used to parameterise the instruments locally and to record individual measured values, etc. READ30 allows users to assemble entire setups for recording measured values, including a graphic signal display for up to sixteen transmitters.

Series 33 X typically offers a pressure port of G1/4" male or G1/2" male thread as the process connection. Series 35 X adds a transmitter with a flush front diaphragm to the product range; 36 X W is the depth / water level transmitter version.

Users can choose from three electrical plug connectors. These are easily changed over when the instruments are used in different environments. If protection class IP68 is required (standard for the 36 X W depth sensor), a version with a cable connection is also available. ■

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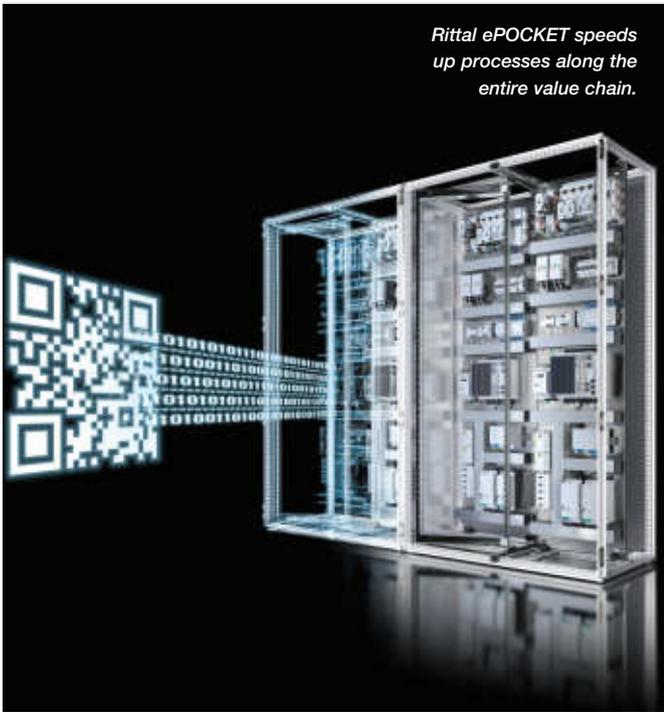


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THE DIGITAL WIRING plan – Rittal ePOCKET, provides a central storage location for plant and machine documentation. It helps maintain technical documentation such as service manuals, operating instructions and others in common file formats and enables easy access at any time.

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- Reduction of carbon footprint
- Constantly up to date data in the control cabinet pocket for all project participants
- Changes cannot be lost due to transparent change tracking and automatic notification

### Added values in maintenance and service

- Time savings in maintenance and repair cases due to fast retrievability of information / fast troubleshooting due to fast localisation of the right control cabinet on site
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- Reduction of the risk of errors due to incorrect documentation
- Reduction of fire risk (no paper inside the control cabinet)
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# Project Databank

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## UAE MEGAPROJECTS

Project Name	City	Facility	Budget (US\$)	Status
ADNOC - Hail and Ghasha Megaproject - Overview	Abu Dhabi	Offshore Gas Field - E&P	15,000,000,000	Construction
ADNOC Offshore - Umm Shaif Gas Cap Condensate Development	Umm Shaif	Gas Processing	1,500,000,000	EPC ITB
ADNOC - Al Dhafra Petroleum - Haliba Oil Field - Overview	Haliba	Onshore Drilling & Production	1,350,000,000	Construction
ADNOC - Hail and Ghasha Megaproject - Manayif Gas Processing Plant	Ghasha	Gas Field, Sulphur Recovery, Gas Processing, Gas Gathering	6,000,000,000	EPC ITB
ADNOC - Hail and Ghasha Megaproject - Manayif Utilities & Tie-ins	Ghasha	Gas Field - E&P	2,000,000,000	FEED
ADNOC - Hail and Ghasha Megaproject - Offshore Gas Processing Plant	Ghasha	Offshore Gas Field - E&P	2,000,000,000	FEED
ADNOC - Hail and Ghasha Megaproject - Compression Facilities	Hail	Offshore Gas Field - E&P	3,000,000,000	FEED
ADNOC Refining - Crude Flexibility Project (CFP)	Ruwais	Atmospheric Residue Desulphurisation (ARDS)	3,500,000,000	Commissioning
ADNOC Offshore - Das Island Crude Oil Tank Farm	Das Island	Offsite & Storage Tanks	1,000,000,000	FEED
ADNOC - TAQA - HVDC Subsea Transmission System (Lightning Project)	Abu Dhabi	Power Transmission Lines	4,000,000,000	Construction
ADNOC Gas Processing - Northern Emirates Gas Network Upgrade - VFD Motor-Driven Compressors	Abu Dhabi	Gas Compression	1,000,000,000	EPC ITB
ADNOC Gas Processing - Northern Emirates Gas Network Upgrade - Overview	Various	Seamless, District Gas Network	1,600,000,000	Engineering & Procurement
Ta'ziz - Ruwais Derivatives Park - Overview	Ruwais	Methanol, Ammonia, Chlor Alkali, Maleic Anhydride	5,000,000,000	EPC ITB
ADNOC LNG - Fujairah LNG Export Terminal	Fujairah	LNG Terminal, Storage Tanks, Liquefied Natural Gas (LNG)	4,500,000,000	FEED
ADNOC Onshore - Bab Integrated Facilities Project	Bab	Drilling & Production	2,000,000,000	Commissioning
ADNOC - Borealis - Borouge 4 Complex - Polymers Production Package	Ruwais	Polypropylene	1,900,000,000	Construction
ADNOC - Borealis - Borouge 4 Complex - Central Petrochemical Process Package	Ruwais	Steam Cracker	2,000,000,000	Construction
ADNOC - Borealis - Borouge 4 Complex - Utilities & Offsites Package	Ruwais	Offsites & Utilities	1,800,000,000	Construction
ADNOC - Borealis - Borouge 4 Complex - Overview	Ruwais	Polyethylene, Polypropylene	6,200,000,000	Construction
Al Yasat Petroleum - Belbazem Oil Field Development Procurement	Belbazem	Drilling & Production	1,000,000,000	Engineering & Procurement
ADNOC - Dalma Field Development - Overview Procurement	Dalma	Gas Field	2,000,000,000	Engineering & Procurement
ADNOC - Dalma Field Development - Gas Dehydration Facilities Procurement	Dalma	Gas Field	1,100,000,000	Engineering & Procurement
ADNOC Onshore - Bu Hasa Integrated Field Development (BUIFD)	Bu Hasa	Drilling & Production, Welded Pipeline	1,645,800,000	Construction
ADNOC Onshore - Replacement of Flowlines & Wellheads Installation	Various	Oil Field, Gas Field, Seamless Pipelines	1,500,000,000	Construction
ADNOC Gas Processing - Asab 1 & 2 Capacity Enhancement	Asab	Gas Processing	1,500,000,000	FEED ITB
ADNOC Offshore - Umm Shaif Long Term Development - Drilling & Processing Facilities	Umm Shaif	Offshore Drilling & Production	3,000,000,000	EPC ITB
ADNOC Offshore - Umm Shaif Long Term Development - Wellhead Towers & Subsea Pipelines	Umm Shaif	Offshore Drilling & Production	1,000,000,000	Engineering & Procurement
ADNOC - Fujairah Mandous Field	Mandous	Offsite & Storage Tanks	2,200,000,000	Construction
ADNOC Refining - Ruwais Refinery East - Upgrade & Debottlenecking of Condensate Refining Trains	Ruwais	Drilling & Production		FEED ITB
ADNOC Offshore - Upper Zakum Facilities Expansion (UZ1000) - Phase 1 - Overview	Upper Zakum	Offshore Drilling & Production	8,000,000,000	PMC
ADNOC Offshore - Upper Zakum Facilities Expansion (UZ1000) - Surface Facilities Package	Upper Zakum	Offshore Drilling & Production	7,000,000,000	PMC
SNOC - ENI - Onshore Acreage Exploration (Areas A, B and C)	Sharjah	Drilling & Production Pipeline	1,000,000,000	Construction
ADNOC LNG - Integrated Gas Development (IGD) - Expansion - Overview	Das Island	Gas Field	1,370,000,000	Construction
ADNOC Offshore - Umm Shaif Gas Cap Development -- Gas Cap Reservoir	Umm Shaif	Offshore Gas Field	2,000,000,000	Feasibility Study
ADNOC - Ghasha Concession Deep Gas Project - Overview	Ghasha	Offshore Gas Field	1,200,000,000	PMC



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# Project Databank

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## Project Focus

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### ADNOC Onshore - Bab Facility Upgrade

<b>Name of Client</b>	ADNOC Onshore
<b>Revised Budget (US\$)</b>	250,000,000
<b>Contract Value (US\$)</b>	227,000,000
<b>Award Date</b>	2022-Q1
<b>Main Contractor</b>	Robt Stone (ME)
<b>Facility Type</b>	Gas Field, Gas Processing, Polymers
<b>Status</b>	Engineering & Procurement
<b>Location</b>	Bab, UAE
<b>Project Start</b>	2020-Q3
<b>End Date</b>	2023-Q2

### Background

ADNOC Onshore has announced plans to conduct simultaneous injection of polymers and gas in the Bab field. The project was initiated under the lines of Bab Field SIMGAP EOR Project.

### Project Status

Date	Status
Oct 2022	Robt Stone has confirmed that all skid works are done in-house and that there is no need for automation work for the project. The construction phase will soon commence.
Sep 2022	Robt Stone will use advanced polymers and CO <sub>2</sub> captured from its carbon capture utilisation and storage facility at Al Reyadah to boost recoverable reserves up to 70% while unlocking additional barrels of Murban crude.
Mar 2022	The engineering and procurement activities have commenced.

### Project Scope

The project's scope of work will include:

- Two new single-string oil producer wells
- Tie-in to existing test M-0101 in RDS-10 with the replacement of existing carbon steel piping
- New test separator 300 with HIPPS at RDS-10
- Tie-in to new cold flare system in RDS-10
- New demulsifier package for the test separator
- One new carbon dioxide (CO<sub>2</sub>) injection well
- One new polymer injection well
- CO<sub>2</sub> pipeline routed from Bab SIMGAP area to Bu Hasa CO<sub>2</sub> pilot testing area
- Decongesting the existing network of flowlines

## 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	SEPTEMBER 2022			VARIANCE	AUGUST 2022		
	Land	Offshore	Total	From Last Month	Land	Offshore	Total
<b>Middle East</b>							
ABU DHABI	36	13	49	0	37	12	49
DUBAI	0	1	1	0	0	1	1
IRAQ	55	0	55	+1	54	0	54
JORDAN	0	0	0	0	0	0	0
KUWAIT	27	0	27	0	27	0	27
OMAN	47	0	47	0	47	0	47
PAKISTAN	7	0	7	-5	12	0	12
QATAR	3	8	11	0	3	8	11
SAUDI ARABIA	60	12	72	+4	58	10	68
SUDAN	2	0	2	0	2	0	2
SYRIA	0	0	0	0	0	0	0
YEMEN	2	0	2	+1	1	0	1
<b>TOTAL</b>	<b>239</b>	<b>34</b>	<b>273</b>	<b>+1</b>	<b>241</b>	<b>31</b>	<b>272</b>

### North Africa

ALGERIA	34	0	34	+1	33	0	33
EGYPT	25	7	32	-1	25	8	33
LIBYA	4	0	4	+2	2	0	2
TUNISIA	2	0	2	0	2	0	2
<b>TOTAL</b>	<b>65</b>	<b>7</b>	<b>72</b>	<b>+2</b>	<b>62</b>	<b>8</b>	<b>70</b>

Source: Baker Hughes



تسليم مشروع «جبال حف» كان علامة فارقة للشركة وللبلد معا

من ثاني أكسيد الكربون 10,7 مليون طن، وهو أقل بكثير من هدفنا البالغ 11,3 مليون طن. وتراجع حجم الغاز المشتعل بنسبة 22 في المائة، وأدركنا 18 فرصة لكفاءة استخدام الطاقة، فوفرننا 0,2 مليون طن من مكافئ ثاني أكسيد الكربون، وانخفض حجم غازات الاحتباس الحراري بنسبة 7 في المائة، ولو لم نتصرف بحرص وكفاءة، لكانت مستويات الانبعاثات لدينا أعلى من الانبعاثات الحالية بنسبة 30 في المائة.

ونواصل العمل على إنشاء مشاريع الطاقة الشمسية بعد نجاح مشروع «مرآة» ومحطة «أمين» الجبارة للطاقة الكهروضوئية بقدرة 100 ميغاواط، فإنتاج المشروعان أكثر من 340 تيراواط في الساعة من الطاقة الشمسية في عام 2021 وحده. ومن المتوقع أن ينتجا طاقة توفر نحو 95,5 مليون متر مكعب من الغاز سنويا.

الأهم من ذلك أننا وضعنا «خارطة طريق تزعم الكربون» التي ترسم مساراً واضحاً

لتحقيق هدفنا المتمثل في خفض الانبعاثات الكربونية إلى النصف بحلول عام 2030 (مقارنة بعام 2019). وسيمكّننا ذلك من اتخاذ الخيارات الفنية والتجارية الصحيحة، وبالسرية المناسبة، للمساعدة على توجيه دفة «شركة تنمية نفط عُمان» لتصبح إحدى شركات الطاقة التنافسية والمستدامة بنهاية العقد الجاري.

• ما مدى أهمية التحول الرقمي في تحقيق عمليات مستدامة وفعالة ومجدية من حيث التكلفة؟

- يعيد التحول الرقمي تشكيل العمليات في قطاع النفط والغاز. ذلك لأن وفرة سيل من البيانات والتقدم التكنولوجي هما ما يجعل المستقبل ممكنا اليوم. فالقدرة على فهم سلوك الآلات والتدخل لتقليل أي تعطل لأدنى درجة، وإملاك توائم رقمي للأجهزة لتشغيل السيناريوهات المحتملة، وأتمتة العمليات باستخدام الروبوتات، ونشر طائرات مسيرة لتحديد أي انتهاكات للسلامة، فما كل ذلك إلا أمثلة تعين الشركة على تحقيق

وقد استندت فلسفتنا في العمل إلى أربع ركائز أساسية: تعيين كوادر المقاولات المهرة، وتعظيم مشتريات السلع والخدمات العمانية، وتطوير البائع المحليين، والاستثمار الاجتماعي.

وارتفع إجمالي إنفاقنا داخل الدولة لخدمة المشروعات وتنمية القدرات البشرية وارتفعت الإنتاجية في اقتصاد السلطنة بنسبة 4 في المائة حتى بلغت 38 في المائة في عام 2021. وطرخنا 34 مناقصة جديدة بمتوسط زيادة للقيمة المحلية المضافة بلغ 10 في المائة في دورة تلك العقود، وارتفع إجمالي القيمة المحلية المضافة لدينا بأكثر من 20 في المائة منذ عام 2013، حين أرحنا الستار عن استراتيجية القيمة المحلية المضافة لقطاع النفط والغاز.

الاستدامة لعملياتها ورفع كفاءتها وجعلها أجدي من حيث التكلفة. ونعمل حاليا على تنفيذ أكثر من 200 مشروع رقمي في مجال تكنولوجيا المعلومات والمجالات الرقمية.

• ما التقدم الذي أحرزته الشركة في زيادة القيمة المحلية المضافة، وهل توجد أي مبادرات يمكنك تسليط الضوء عليها في هذا الصدد؟

- ساهم برنامج القيمة المحلية المضافة الخاص بالشركة في تحسين حياة الآلاف، من خلال الاحتفاظ بالمزيد من إجمالي إنفاقنا في البلاد لخدمة تطوير الأعمال، وبناء القدرات والكفاءات العمانية، وتحفيز الإنتاجية والتنوع في اقتصاد البلاد.

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## توفير الدعم اللازم لتحويل الطاقة



سامي باقي

في هذا الحوار، يحدثنا السيد سامي باقي، المدير التنفيذي للشؤون الفنية بشركة تنمية نفط عُمان، عن استراتيجية الشركة في مجال الاستكشاف والإنتاج، وتنامي تركيزها على تحويل الطاقة، والتقدم الحاصل في زيادة القيمة المحلية المضافة. أما عن الانبعاثات، فهو يقول: أحرزنا خلال عام 2021 تقدماً كبيراً من خلال مواصلة الحد من انبعاثات غازات الاحتباس الحراري والاستمرار في تقليل حجمها لأدنى درجة من خلال برنامج «الكربون وكفاءة رأس المال» لدينا. وإلى نص الحوار:

• هل لك أن تعرفنا على أهداف «شركة تنمية نفط عُمان» لاستكشاف النفط والغاز وإنتاجهما، وبعض المشاريع الرئيسية المخطط لها والجارية لتحقيقها؟

- تعتبر «شركة تنمية نفط عُمان» شركة الاستكشاف والإنتاج الرائدة في سلطنة عُمان. فحن من نوفر غالبية إنتاج النفط الخام وإمدادات الغاز الطبيعي في البلاد. والأهم من ذلك أننا نركز على تحقيق التميز والنمو والقيمة المستدامة داخل قطاعنا وخارجيه. وتشغل 202 حقول من حقول النفط المنتجة، و43 حقلاً للغاز، و29 محطة إنتاج، وأكثر من 9,400 بئر نشطة، وأكثر من 33 ألف كيلومتر من خطوط الأنابيب وخطوط التدفق، و230 وحدة تشغيل في أسطولنا لهندسة الآبار الذي يشمل 52 برج حفر و51 رافعة.

كما ساهمت قوة تركيزنا على التسليم في إتمام عام ناجح آخر على جبهة الاستكشاف، بإجمالي 111 مليون برميل من النفط و0,6 مليار قدم مكعب من الغاز محجوز كموارد لحالات الطوارئ التجارية. وعلى الرغم من القيود التي فرضها فيروس كورونا على التنقل وتوفر الكوادر البشرية والضغوط على سلسلة التوريد لدينا، فقد أنتجنا كميات من النفط والغاز والمكثفات بإجمالي 1,223 مليون برميل نفط يوميًا. وأغلق إجمالي إنتاج النفط عند 635 ألف برميل يوميًا، أي أقل من المستهدف بمقدار 5 آلاف برميل يوميًا. وانخفض إنتاج الغاز السنوي بمقدار 14 مليون متر مكعب يوميًا، أي أقل

الطاقة. وفيما نواصل النهوض بأعمالنا الأساسية في إنتاج الهيدروكربونات، فإننا نستثمر أيضاً لضمان تحسين كفاءة استخدامنا للطاقة، خاصة في الأنشطة التي تستهلك كمية هائلة من الطاقة كالرفع الصناعي وإدارة المياه، وهما يشكلان أكثر من نصف استهلاكنا من الطاقة. وستسعى الشركة إلى النهوض بدورها فيما تبني عُمان سلاسل أعمال جديدة منخفضة الكربون وتسارع بإنشاء مشاريع منخفضة التكلفة والكربون في مجالات الطاقة المتجددة باستخدام طاقة الشمس والرياح والهيدروجين.

وعلى الاستفادة من الشراكات داخل وخارج قطاعنا وإبلائها الأولوية للتصدي لمخاطر تراجع الإيرادات، كما توقعته الوكالة الدولية للطاقة للاقتصادات المعتمدة على الهيدروكربونات. وفي هذا الصدد، فإننا فخورون بدورنا في «التحالف الوطني للهيدروجين» الجديد، إذ يمثل تعاوننا تاريخياً بين 13 مؤسسة من القطاعين العام والخاص. وسوف يضع ذلك عُمان بقوة على الخريطة لتطوير واستخدام الهيدروجين النظيف في ظل انتقالنا إلى اقتصاد يتمتع بقدر أكبر من الاستدامة والتنوع.

• ما هي التدابير التي تتخذها الشركة لدعم خفض الانبعاثات ونزع الكربون؟

- أحرزنا خلال عام 2021 تقدماً كبيراً من خلال مواصلة الحد من انبعاثات غازات الاحتباس الحراري والاستمرار في تقليل حجمها لأدنى درجة من خلال برنامج «الكربون وكفاءة رأس المال» لدينا. وقد بلغ حجم انبعاثات الشركة

من المستهدف البالغ 71 مليون متر مكعب يوميًا بسبب انخفاض طلب العملاء، في حين كان إنتاج المكثفات أقل قليلاً من المستهدف البالغ 104 آلاف برميل يوميًا. وتبني الشركة على الدوام في تنفيذ أكثر من 200 مشروع لدعم الإنتاج المستدام للنفط والغاز.

وتعززت جهود الإنتاج بفضل النجاح الباهر في تسليم 684 بئرًا في إطار خطة تسليم 622 بئرًا، و2,350 تدخلًا للرافعات في إطار خطة استهدفت 1,980 تدخلًا، و22,666 حالة إتمام وتدخلات للآبار في إطار خطة استهدفت 20,948 حالة. كما تمكنا من تقليل وقتنا غير الإنتاجي إلى 4,8 في المائة، وهو أقل وقت مسجل على صعيد الآبار.

وكان تسليم مشروع «جبال حُف»، وهو ثاني أكبر مشروع من مشاريع الشركة وأعقدها فنياً، إنجازاً كبيراً لكل من الشركة والدولة، ولا سيما في ظل قيود فيروس كورونا المستمرة. فهو قادر على إنتاج 5 ملايين متر مكعب من الغاز ونحو 20 ألف برميل من النفط الخام يوميًا. فسيوفر الطاقة ويدر إيرادات ستساعد على تأمين مستقبل بلادنا لعدة سنوات قادمة.

• كيف تدعم الشركة مجال تحويل الطاقة، وما حجم تطوير الهيدروجين في خططكم؟

- لم تزل الشركة ملتزمة بـ «رؤية عُمان للطاقة 2040» في إطار سعيها إلى تحويل تحديات تغير المناخ إلى فرص، بينما تعمل في الوقت ذاته على تلبية تزايد الطلب على

مئوية، فيسهل تخزينها ونقلها. والبنية التحتية اللازمة لها موجودة بالفعل في محطات منتشرة في 120 مينا في ربوع العالم. وعلاوة على ذلك، فإن معدل كفاءة تكنولوجيا تكتيف الهيدروجين وتحويله إلى أمونيا مرتفع للغاية. وتركيب أجهزة تكسير الأمونيا، جنباً إلى جنب مع مراكز إنتاج واستهلاك الهيدروجين الأخضر، سيدعم تطوير اقتصاد وقود الهيدروجين. ولا تزال هذه الأجهزة غير متوفرة بكثرة، ولكن كفاءتها النظرية عالية، ويجب بذل الجهود لإنتاجها بسرعة وعلى نطاق واسع.

ومن ثمارها الأخرى تخزين الطاقة، وقد تجلت أهميتها في أزمة الطاقة الناجمة عن الحرب الدائرة في أوكرانيا. إذ يمكن تخزين الأمونيا لأطول فترة لازمة، مما يوفر احتياطياً مهماً يكفل أمن الطاقة، وتغني صهاريج التخزين الكبيرة الرخيصة عن ضرورة أن يكون الإنتاج على قدر الاستهلاك.

وتفتح جهود البحث والتطوير الدؤوب الباب أمام استخدامات إضافية للأمونيا. ففضلاً عن دورها في نقل الهيدروجين، يمكن استخدامها أيضاً كوقود، ولا سيما للسفن. فمع أنها أقل قابلية للاشتعال، فإن كثافة طاقتها أعلى بمقدار 1.5 مرة من الهيدروجين السائل. والجهود التعاونية جارية لا ابتكار محركات بحرية آمنة وقوية وصديقة للبيئة. إذ يهدف اتحاد شركات أوروبية إلى تصنيع سفينة خالية من الانبعاثات تعمل بوقود الأمونيا بحلول عام 2025.

وأيضاً توليد الطاقة من التطبيقات الأخرى للأمونيا. إذ يمكن استخدامها كوقود يغني عن الفحم أو زيت الوقود الثقيل أو الديزل. ولا ينكر أحد أن هذا ليس السبيل الأمثل لاستخدام الأمونيا والهيدروجين، ويكمن السبب الوحيد المقبول - لقيامنا بذلك - في رغبتنا في تسريع استخدام الهيدروجين الأخضر والاستفادة من البنية التحتية الحالية. وتسعى اليابان إلى إنشاء محطة طاقة تعمل بالفحم والأمونيا، ويجري حالياً تطوير توربينات الأمونيا المباشرة التي تستخدم الهيدروجين كمرسّع لتحسين عملية الاشتعال. ويمكن أن توفر توربينات الأمونيا بديلاً خالياً من الكربون وأجدي من حيث التكلفة لاستخلاص الكربون أو تخزينه في بطاريات، خاصة بالنسبة للدول التي تشغل حالياً توربينات الديزل. وينبغي تكتيف البحث في هذا المجال لحل مشكلة انبعاثات أكاسيد النيتروجين على جناح السرعة.

وأخيراً، يمكن استخدام الأمونيا الخضراء كعنصر أساسي لإنتاج مواد كيميائية أخرى كالأسمدة الخالية من الوقود الأحفوري. وتتعدد المشاريع الجارية التي تبحث عن طرق بديلة للجمع بين الكربون والهيدروجين لتصنيع البلاستيك. ويمكن أن تشمل استخلاص الكربون واستغلاله لإنتاج الهيدروكربونات بدلاً من إطلاق ثاني أكسيد الكربون في الغلاف الجوي.

الأمونيا الخضراء يمكن أن تكون حجر أساس لمستقبل خالٍ من الكربون سيكون للأمونيا الخضراء دورٌ عظيم الأثر في تحول الطاقة. وخلاصة القول إن الطاقة المتجددة والهيدروجين والأمونيا سيكون لهم دورٌ في استغناء الإنسان عن الوقود الأحفوري والتخلص من الانبعاثات الكربونية. ولكن يجب زيادة طاقة الإنتاج بشدة لتقليل التكاليف وزيادة القدرة على المنافسة. وستصبح الأمونيا - حينئذٍ - سلعة عالمية من سلع الطاقة المتجددة. إذ تتمتع بالمرور اللازمة لاستخدامها كنقل للطاقة ووقود وكمكون للمواد الكيميائية الأخرى، شأنها في ذلك شأن النفط الخام اليوم.

تعمل شركة «فيرانو إنرجي» على إنشاء مشاريع لإنتاج الهيدروجين بطاقة تتجاوز 30 جيجاواط في تشيلي وبيرو، وهي واحدة من أكبر المشاريع قيد الإعداد في العالم.

هائلة تفوق الطلب، وتكثر كمية الكهرباء المولدة من مصادر الطاقة المتجددة، وخاصة الطاقة الشمسية، لدرجة تهدد بإفساد قدرة الشبكة. ومع أن العمل جارٍ على ابتكار أنظمة تخزين الطاقة في بطاريات، فلم تزل غير قادرة على استخلاص هذه الكمية الزائدة من الطاقة وتخزينها. ويكون الحل في التقليل، وهنا يجب مشغلو الشبكة الوصول إليها أو يعتمدون آليات تسعير تفرض تسعيراً سلبياً لتقليل الإنتاج. وتشير بعض التقديرات إلى أن تقليص الطاقة المتجددة يصل إلى 20 في المائة من طاقة الإنتاج.

والحل هنا - بدلاً من تقليص الطاقة المتجددة الزائدة - هو أن نستخدم هذا الفائض لإنتاج الهيدروجين الأخضر. فمن خلال تركيب المحلل الكهربائي في المحطات الفرعية الرئيسية المتصلة بمحطات الطاقة المتجددة، يمكن أن يكون إنتاج الهيدروجين الأخضر أداة من أدوات توازن الحمل. وسوف يكفل ذلك تنافسية التكلفة. ذلك أن الطاقة المتجددة ستهدر بغير هذا السبيل، كما سيسمح لمشغلي محطات الطاقة المتجددة بتحصيل عائد مقابل كل ميجاواط في الساعة ينتجونها، ولا سبيل لإهدار الطاقة.

وعلى هذا النحو، سيكون إنتاج الهيدروجين الأخضر حافزاً على زيادة النمو في مصادر الطاقة المتجددة. ولكن يجب ألا ينتقص ذلك من كمية الكهرباء المتوفرة للاستخدامات الأساسية والأكثر فاعلية الأخرى، بل يجب أن يعتمد على الكهرباء الزائدة. ولا بد أن تسير عملية الانتقال إلى الهيدروجين الأخضر، وعملية تسريع توليد الطاقة المتجددة جنباً إلى جنب.

ويمكن أن ينهض الهيدروجين أيضاً بدور تكميلي نافع لحلول تخزين الطاقة الحالية. فالبطاريات من الحلول المجدية من حيث التكلفة لتخزين الطاقة على أساس يومي أو حتى أسبوعي، ولكن بما أن تقليص الإنتاج عادة ما يكون موسمياً، فلن يكون تخزين الطاقة لمدة ستة أشهر في البطاريات مجدياً من حيث التكلفة، على الأقل البطاريات التي نعرفها اليوم. فإذا كانت الطاقة المتجددة ستحل محل الوقود الأحفوري، فسنتحتاج إلى وسائل تخزين موسمية أو حتى سنوية، وكذلك شراء تلك الطاقة وبيعها بين الدول. والجزيئات الخضراء حلٌّ مثاليٌّ لتلك الغاية.

## الأمونيا الخضراء ركيزة أساسية

### لثورة الهيدروجين

في حين أننا سنضخ معظم كميات الهيدروجين المنتجة في خطوط الأنابيب الحالية وبيعها ونشرها إقليمياً، فإن بعض المناطق مثل أمريكا اللاتينية والشرق الأوسط وشمال إفريقيا قادرة على إنتاج كميات تفوق حاجتها من الهيدروجين النظيف. وستحرم مناطق أخرى مثل اليابان وكوريا وهاواي من مصادر الطاقة المتجددة التي تكفي احتياجاتها وستحتاج إلى استيراد الهيدروجين.

إلا أن نقل الهيدروجين لمسافات طويلة لا يجدي ولا يحقق عائداً اقتصادياً ملموساً. إذ يتطلب نقله، بكميات كبيرة من قارة لأخرى، بنية تحتية جديدة كاملة للإسالة والتوزيع في الموانئ والمحطات ومواقع التخزين. وهنا تقدم الأمونيا حلاً تنافسياً.

يُقدّر تقرير حديث، نشرته الوكالة الدولية للطاقة المتجددة، أن أكثر من نصف التجارة العالمية في الهيدروجين ستكون في شكل أمونيا. ذلك لأن الهيدروجين يُسال عند درجة حرارة تبلغ «-252» درجة مئوية، وهو شديد التفاعل، ويتطلب مواداً مقاومة للتآكل، مما يجعل عملية التخزين والنقل باهظة التكلفة. وعلى الصعيد الآخر، يمكن تكتيف الأمونيا فتتحول إلى سائل عند درجة حرارة تبلغ «-33» درجة



التحول إلى الهيدروجين الأخضر وتسريع الطاقة المتجددة يجب أن يعمل جنبا إلى جنب

## مستقبل أسواق الهيدروجين الأخضر

يقول المهندس كولين هاميلتون، رئيس العمليات ورئيس قسم الهندسة بشركة «فيرانو إنرجي»، في هذا المقال إن الأمونيا الخضراء ستكون «الخام» الخالي من الوقود الأحفوري لاقتصاد وقود الهيدروجين. فالهيدروجين قادرٌ على نزع الكربون من باقية من الصناعات الثقيلة، كالطاقة والكيماويات والصلب والأسمت. وهذا يدل على أن الطلب سيكون هائلا، فنتوقع الوكالة الدولية للطاقة، في سيناريو التخلص من الانبعاثات الكربونية، أن يزيد الطلب بمقدار خمسة أضعاف من عام 2020 وحتى عام 2050.

الأكسجين، وهي عملية مكلفة وتستهلك كمية هائلة من الطاقة. ولكن حين تكون الطاقة المستخدمة من مصادر متجددة؛ كالماء أو الرياح أو الشمس، فإنها توفر ناقل طاقة متعدد الاستخدامات وخاليا من الوقود الأحفوري. كيف يمكننا زيادة قدرة الهيدروجين على المنافسة؟ أولا، عن طريق استخدام مصادر غنية بالطاقة المتجددة كالطاقة الشمسية الكهروضوئية في تشيلي والمملكة العربية السعودية وأستراليا، حيث سيكون إنتاجه شديد التنافسية. وثانيا، عن طريق تكثيف إنتاج الطاقة المتجددة والاستعانة بالمحلل الكهربائي لإنتاج الهيدروجين بالطاقة المتجددة «الزائدة» أو «المقلصة». وسوف يسمح ذلك بإدخال نسبة أعلى من الطاقة المتجددة إلى السوق عن طريق الحد من تقليص الطاقة المتجددة.

### الحد من تقليص الطاقة المتجددة

يترتب على تقطع الطاقة المتجددة وجود فترات يتم فيها إنتاج الطاقة بكميات

غير أن هناك بعض التحديات الجسام التي ينبغي تجاوزها حتى يصبح الهيدروجين قادراً على المنافسة؛ أولها إنتاج كميات كافية من الهيدروجين «الأخضر» المتجدد. وثانيها القدرة على تخزين هذا الهيدروجين بكميات كبيرة. وثالثها إنشاء البنية التحتية اللازمة لتجارة ونقل الهيدروجين. وهنا يتجلى دور الأمونيا، إذ يتألف جزيء الأمونيا (ورمزه الكيميائي: NH<sub>3</sub>) من ذرة نيتروجين وثلاث ذرات هيدروجين، وهو قادر على دعم اقتصاد وقود الهيدروجين في المجالات الثلاثة كافة.

### جعل الهيدروجين

### قادراً على المنافسة

يتم إنتاج معظم كميات الهيدروجين اليوم من الوقود الأحفوري من خلال عملية الإصلاح البخاري للميثان. وينتج عن هذه العملية 830 مليون طن من الانبعاثات ثاني أكسيد الكربون سنويا. في حين يتم إنتاج الهيدروجين «الأخضر»، الخالي من الكربون، باستخدام المحلل الكهربائي لتفكيك جزيئات الماء لفصل الهيدروجين عن

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تقارير خاصة: تقرير أدنوك، معرض أدبيك، العراق.

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الهيدروجين

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دور الامونيا الخضراء في اقتصاد وقود الهيدروجين