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Oil Review Middle East

Oil · Gas · Petrochemicals

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Egypt's gas poised for long-term growth

- QatarEnergy's massive LNG expansion plans
- The outlook for Middle East pipelines
- Unlocking sustainability benefits with technology
- The benefits of continuous pump monitoring
- The rise of autonomous offshore operations

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Middle East

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Editor's note

IN THIS ISSUE, we feature two countries where natural gas is at the centre of their expansion plans. Egypt has witnessed a boom in gas production in recent years as a result of the exploitation of new discoveries, and is expecting between US$7.5bn-US$8bn in exploration and development investment this year as local and international oil and gas companies expand their operations. The country has the potential to become a significant LNG exporter (see p14). While Qatar, already a leading LNG exporter, is set to almost double LNG sales as it pursues its massive North Field East (NFE) expansion project, the single largest project in the history of the LNG industry (see p19).

Our Annual Pipeline Review highlights some of the significant pipeline projects in the Middle East as well as the latest technology developments (p22), while our technology section features pumps, drilling, sour gas processing, data management and autonomous offshore operations.

Contents

Front cover image: Adobe Stock

➔Executives' Calendar, 2022

SEPTEMBER			
5-8	**Gastech**	MILAN	www.gastechevent.com
5-8	**SOGAT**	ABU DHABI	www.sogat.org
6-7	**MENA HSE Forum**	DUBAI	www.hse-forum.com
OCTOBER			
3-5	**SPE ATCE**	HOUSTON	www.atce.org
3-6	**Saudi Pipelines Int'l Conference & Exhibition**	DAMMAM	https://spiconx.sa
3-7	**Africa Oil Week**	CAPE TOWN	www.africa-oilweek.com
4-6	**Energy Intelligence Forum**	LONDON	www.energyintelligenceforum.com
30-3 Nov.	**ADIPEC**	ABU DHABI	www.adipec.com
NOVEMBER			
TBC	**Leadership Excellence Awards & Symposium**	MANAMA	www.lewa-symposium.org
DECEMBER			
TBC	**Middle East Bottom of the Barrel Conference**	MANAMA	www.europetro.com/events

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

Gastech 2022 provides forum to discuss unprecedented industry challenges

GASTECH, WITH CO-HOSTS Baker Hughes, Chevron, Eni, and Tellurian, has announced the conference programme for its 50-year anniversary edition, Gastech 2022 in Milan, the largest integrated industry event for the global natural gas, LNG, hydrogen and low-carbon solutions sector.

Taking place in the Fiera Milano exhibition centre from 5-8 September 2022, Gastech will be hosted under the patronage of the Italian Ministry of Foreign Affairs, Ministry of Ecological Transition, the Italian Trade Agency, and Assorisorse – the Italian Sustainable Energy & Resources Industry Association.

2022 has become a historic year for the gas sector. The crisis in Ukraine has set off a chain of events that could permanently reshape global energy markets. A global supply crisis, and unprecedented market volatility is transforming the status quo, rerouting international supply chains and overturning decades of international energy policy. As the industry faces the critical challenges of decarbonisation, energy security, and energy supply, more than ever before Gastech's 2022 conference will be the forum for the industry to come together and discuss these changes and chart a roadmap for the future.

Occurring just ahead of COP27 in Egypt, Gastech will also be a vital platform for the industry to help set the global net zero agenda, enabling energy leaders to highlight the central role of natural gas, LNG, hydrogen, and low-carbon solutions in achieving a 'just' energy transition.

Gastech's strategic conference will feature influential keynote speakers from the highest levels of industry and government, including: Christiana Figueres, former secretary general of the UNFCCC; Sigmar Gabriel, former vice-chancellor and foreign minister of Germany; and Dan Brouillette, president, Sempra Infrastructure and Former US secretary of energy; Lorenzo Simonelli, chairman and CEO, Baker Hughes; Professor Dr Klaus-Dieter Maubach, CEO of Uniper SE; and Meg O'Neill, chief executive officer and managing director, Woodside Energy Ltd.

Image Credit: dmg events

Christina Figueres, former secretary general of the UNFCCC will be among the speakers.

Christopher Hudson, president of Global Energy, dmg events, commented, "With energy prices putting a real squeeze on consumers in Europe and across the world, the global gas and LNG sectors have a crucial role in alleviating supply shortages and energy security challenges. This year's Gastech will be the major platform for the industry to navigate a transformed energy map in the wake of Russia's invasion of Ukraine and to find urgent solutions to the global energy crisis ahead of the winter heating season. As COP27approaches, questions of how to secure sustainable energy supplies and how the gas sector can make a positive, proactive contribution to the global fight against climate change will also take centre stage at Gastech 2022."

For further information see the website at www.gastechevent.com

Connecting futuristic global pipeline sectors

WITH THE INCREASE in pipeline projects across the world linking countries and continents, the associated financial and business commitments are huge, and thus the robustness and reliability of pipeline systems are of paramount importance to societies at large. The pipelines sector is expected to register a CAGR of more than 6.5% during 2022-2027.

It is against this backdrop that the Saudi Pipeline International Conference & Exhibition (SPICONX) will be held from 3-6 October at Dhahran EXPO, under the theme 'Connecting futuristic global pipeline sectors'.

The primary objective of SPICONX is to establish a professional environment which facilitates the exchange of pipeline industry best practices and expertise which can be used to optimise pipeline design and operational strategies. In addition, new models and technologies will be presented allowing participants to acquire up-to-date knowledge and awareness of industry evolution.

Featuring more than 50 international and regional experts, the conference will cover topics including green energy pipelines; smart pipelines for the future; strategic planning & economics; design, manufacturing, construction & project management; operations, inspections, maintenance & integrity management; safety,

Image Credit: Adobe Stock

The event looks to bring together the global pipeline community.

security, health & environmental management; risk assessment & management; human resources development for pipeliners; and pipelines facilities instrumentation & logistics.

Technical workshops will provide an exclusive opportunity to a limited number of attendees to understand the in-depth technical elements involved in the successful operations of complex pipeline structures.

More than 100 exhibitors and sponsors will present technologies and products revolutionising the global pipelines industry

"2022 Saudi Pipeline International Conference and Exhibition (SPICONX) will demonstrate the importance of the pipeline sector, and the need for developing and implementing advanced pipeline systems to create a sophisticated network across the globe to enhance the supply and demand of the most precious commodities," said Abdullah M. Al Mansour, vice president - Pipelines Distribution & Terminals Saudi Aramco and SPICONX president.

"The three-day conference and exhibition will highlight the innovation and technology advancements in the pipeline sector, whilst providing a highly conducive platform for the industry experts and pipeline enthusiasts from across the globe to achieve "Business and Technical Acumen in the Pipeline Sector". With the vision to connect the global pipeline fraternity under one roof, this will be the perfect platform to meet, network, exchange ideas and forge new business relations."

"This is the very first time a conference dedicated to the Pipelines sector with this magnitude has ever been hosted in the Middle East. SPICONX's vision is to gather 'Pipeliners' from around the globe and establish an international platform to connect and build on the successes achieved so far and shape the future," said Mohammad A. Al-Hatlani, general manager - Pipelines Saudi Aramco and chairman of SPICONX.

For further information see the website at https://spiconx.sa

The future of energy: transition and security

THE SIXTH ANNUAL International Energy Summit takes place from September 27-29 2022, at the Hilton on Park Lane Hotel in London, UK. Organised by AIEN, this premier event provides a global forum for energy professionals to network with colleagues, build professional connections and develop potential partnerships. Stay up-to-date on current trends and challenges in the international energy industry by attending sessions that include high-profile speakers, interviews, hot topics, fireside chats, moderated discussions and more.

The 2022 IES programme highlights include globally recognised speakers and experts; four pre-conference workshops; sessions addressing the industry's current challenges, emerging trends, and technologies; formal and informal networking opportunities, including speed networking; and an Awards dinner and celebration.

This year's event delves into the intersection between energy transition and energy security. Topics to be featured include:

- Exploration Leaders Panel
- Africa's Energy Future
- Financing the Future: Energy Transition & Changing Business Models
- Legal Heavyweights: Mitigating Risk and Navigating the Complexities of Modern Practice
- Carbon Capture & Storage
- North Sea in Transition
- Hydrogen in the Energy Transition: Between 'Silver Bullet' and 'Mere Hype'
- M&A in the Energy Transition
- Natural Gas: The Key to Energy Transition & Energy Security
- Transferable Skills and the Energy Transition

The workshops will cover bid round strategies and transferable tactics; turning hydrogen hyperbole into contractual reality; negotiating

Image Credit: Adobe Stock

The event will focus on energy transition and energy security.

skills and changing partners; and mapping carbon credit markets and verification practices.

Speakers include Gretchen H. Watkins, president, Shell USA; Simon Flowers, chairman, Wood Mackenzie; Felipe Arbeláez, SVP Hydrogen and CCUS, bp; Kevin McLachlan, SVP Exploration, TotalEnergies; Maynard Holt,founder and CEO, Veriten; Deirdre Michie OBE, CEO, OEUK; Dr. Berislav Gašo, EVP Upstream, MOL Group;; Stuart Cooper, EVP Strategy, Commercial & BD Harbour Energy; Katie Jackson, EVP Acquisition, Divestment & New Business Delivery, Shell International; NJ Ayuk, chairman, Africa Energy Chamber; James Janoskey, managing director, global co-head Energy Group and head of EMEA EPRM, JP Morgan; Nick Cooper, CEO, Storegga (Acorn CCS); Philip Hemmens, head of North Europe Management, MD Liverpool Bay CCS, Eni SpA; and Christof Rühl, senior research scholar, Columbia University Center on Global Energy Policy.

www.internationalenergysummit.org

Optimising HSE and ESG strategy

The Middle East's industry heavyweights are lining up to support the MENA HSE Forum, taking place from 6-7 September at the Grosvenor House, Dubai.

THE MENA HSE Forum is gaining momentum, as leaders from key industries have joined the leading HSE event to share critical insights on new best practices as well as access the latest innovations to advance HSE in the Middle East. More than 200 stakeholders from the HSE community in UAE, Saudi Arabia, Qatar, Oman and Bahrain are expected to attend.

This edition features five key sessions including:

1. **Process Safety Frameworks** – Aramco, Cheiron, Abu Dhabi Waste Management Center (Tadweer) and Kuwait Energy Egypt will demonstrate how to deliver an effective process safety management strategy to increase efficiencies while reducing lost time incidents
2. **Role of HSE Leadership in Crisis Management** – ADNOC, Drydocks World and Zawawi Powertech Engineering will address the challenges faced by companies during any emergency and identify strategies to maintain consistent HSE standards
3. **Future of Digitalisation in HSE** – Petrofac and Fujairah Natural Resources Corporation will analyse the impact of disruptive technologies which can help your organisation create a holistic culture of risk identification
4. **Learning about Occupational Health & Behavioural Safety from Global Transforming Events** – Asyad Drydock, Be'ah, John Energy and Oman Electricity Transmission Company will examine the effect of the pandemic on OHSE to best position your organisation to address these in 2023 and beyond
5. **How ESG moved from a Cost Centre to a Value Driver** – Other key players will share insights on the relationship between ESG and investment returns to help you drive your investment decisions and integrate environmental sustainability in your business.

Speakers include Tahir Azhibek, corporate HSE manager, ADNOC; Dr Naseem Mohammed Rafee, director of health and safety department, Dubai Municipality; Eng Raed Mohammed Al-Marzooqi, manager of studies and system section, health and safety department, Dubai Municipality; Dr Eng Hani Hossni, EHS director Abu Dhabi Waste Management Center (Tadweer); Gerardo Daniel Abalde, group head, Saudi Aramco; Lynn Hobballah, head of health & safety, Petrofac; Saleh Al Balushi, head of HSE, Drydocks World; and Peter Michael Hamel, department head OHSE, Be'ah.

The growing list of sponsors includes Vin Technology Systems, MILWAUKEE, Benchmark ESG, BSI, Clyde & Co, Fugro, GTSC, iOmniscient, ITT-Innovations, MACS-G, ARASCA Medical Equipment Trading and Al Hoty-Stanger.

Image Credit: Alain Charles Publishing

The MENA HSE Forum will bring together key stakeholders from across the region.

> "End users are seeking disruptive technologies that will continue to cut LTI and optimise productivity."

Vinay T, head of Business Development at Alain Charles Events, commented, "Our research with stakeholders from the oil and gas, construction and tourism sectors revealed that end users are seeking disruptive technologies that will continue to cut LTI and optimise productivity.

"We identified a need to access the latest safety solutions for the workforce across the board which led us to create this exclusive platform for HSE companies to display and demonstrate their services and solutions to key players in the region. This is also a premier opportunity to build new relationships and network in person with the MENA HSE community." ■

Please register for the HSE Forum at https://www.hse-forum.com/mena/register

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Grosvenor House, Dubai, UAE

EXCLUSIVE MEETING POINT

for end users from the oil, gas & energy sector and HSE solution providers to come together and define their HSE strategy for a sustainable future

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Tracerco to provide technology to NPCC

JOHNSON MATTHEY PLC'S Tracerco has been awarded a contract by the National Petroleum Construction Company (NPCC) to supply its innovative technology designed to make insight-driven data decisions. It will see Tracerco deliver its Profiler instrumentation to the Belbazem offshore block, Abu Dhabi.


Image credit: Tracerco

Engineer working on profiler in rig.

Expected to yield its first production in 2023 the offshore facilities will have a combined production capacity of 45,000 bpd of oil and 27 MMcf per day of associated gas. It is set to be installed by September into the slug catcher vessel, which provides a buffer volume to accommodate the intermittent high liquid flow in the form of a slug. It will be customised to meet the requirements of the slug catcher and will measure the vertical distribution of multiple interfaces in real time and at high resolution.

The low maintenance instrument can be used to prevent unplanned shutdowns, reduce chemical additive costs, optimise processes in real time, increase throughput and improve environmental compliance.

EGS establishes training centre in Dubai

AS PART OF its growth strategy, and driven by the commitment to create the best customer experience while being closer to its international clients, Euro Gas Systems has established a Middle East and Africa service and training centre in Dubai's Jebel Ali Freezone.

Euro Gas Systems' regional new units sales, aftermarket / technical support, and field service teams will all be housed in EGS Services FZE.

In addition to its international service and training centre, the new facility will carry a substantial Ariel and Waukesha spare parts inventory for the region.

Headquartered in Romania, Euro Gas Systems S.R.L. is an ISO 9001 certified packager of natural gas compressors. It is a partner for Ariel, Innio Waukesha and Caterpillar. In addition to new units and packaging services, EGS also repackages old equipment, incorporating the latest technologies and upgrades as needed.

If your compressors or engines require service, support, training, spare parts or packaging you are in the right place. The Euro Gas team will be more than happy to assist you in any way.

EnerMech secures OPEX and CAPEX contracts

GLOBAL INTEGRATED SOLUTIONS specialist EnerMech has secured a number of OPEX and CAPEX contracts in core and new markets totalling US$128mn across its Africa, Middle East and Caspian locations.

This followed a programme of strategic growth activities, including a new equipment investment of approx US$10mn and a major recruitment drive expanding the team of local hires across these geographies by a projected 63%, in the next 12 months.


Image credit: EnerMech

Paul Cockerill, EnerMech regional director for Africa, Middle East and Caspian.

In total, a broad spectrum of 11 core competency projects have been awarded by eight key clients to the business in Angola, Azerbaijan, Kazakhstan, Qatar, Turkey and the UAE in the last nine months.

Having expanded its crane capabilities in Kazakhstan with a full team of local experts, the division has secured its first crane maintenance contract. The US$6.7mn award will see the team delivering onshore and offshore crane maintenance, repair, inspection and certification services.

Other projects include valve maintenance services provided to a national oil company in the Middle East, crane maintenance and process, pipeline and umbilicals work for a major operator in Turkey and a turnaround and maintenance scope for a national LNG company in Angola.

Aramco expands Namaat plans

THE SAUDI ARABIAN Oil Company (Aramco) has announced a major expansion of its Namaat industrial investment programmes, with 55 agreements and memoranda of understanding across the sustainability, digital, industrial, manufacturing and social innovation sectors.

Namaat, which has grown from 32 to 55 investments since last year, supports industrial investment partnerships, helping to create jobs for Saudis and contributing to national growth and capacity building. The programme aims to enable opportunities for local and international companies and leverage various incentives offered through the government's Shareek programme and other initiatives.

Image credit: Aramco

Ahmad Al-Sa'adi, senior vice-president, technical services, Aramco.

Ahmad Al-Sa'adi, Aramco senior vice-president, technical services, said, "Namaat enables Aramco to be a catalyst for change across the Kingdom's economy at a time of market uncertainty.

This latest phase of expansion for Namaat reflects even greater integration with other venture life cycle programmes that aim to add value and support sustainable growth. It also represents significant progress for the programme, with 19 of the 22 MoUs signed last year already reaching fruition, with a total investment of US$3.5bn.

The new agreements bolster Aramco's long-term growth strategy and the Kingdom's expanding energy and chemicals value chains. They include Kent & Nesma; Larsen & Toubro and Gulf Consolidated Contractors; Samsung Engineering & Al-Rushaid Group, among others.

Others include Honeywell, a joint venture to develop and implement digital technology solutions across industrial facilities, and Armorock and AlKifah Precast to localise the use of polymers in concrete production.

New report highlights role of CCUS for net zero

In its latest report *Carbon Capture, Utilisation and Storage in the Energy Transition: Vital but Limited*, the Energy Transitions Commission (ETC) describes the complementary role carbon capture, utilisation and storage (CCUS) has alongside zero-carbon electricity, clean hydrogen and sustainable low-carbon bioresources in delivering a net-zero economy by mid-century.

MASSIVE CLEAN ELECTRIFICATION is the backbone of global decarbonisation. However, electrification, hydrogen and sustainable low-carbon bioenergy combined cannot reduce gross emissions completely to zero. In addition, it is almost certain that cumulative CO_2 emissions between now and 2050 will exceed the "carbon budget" consistent with a 1.5°C climate objective. So, to limit temperature rises to 1.5°C, carbon removals will be required alongside deep and rapid cuts in emissions.

Carbon Capture, Utilisation and Storage (CCUS) must therefore play three vital but limited roles in the energy transition:

1. To decarbonise those sectors where alternatives are technically limited (e.g. industrial processes which by their nature produce CO_2, such as cement);
2. To deliver some of the carbon removals that are required in addition to rapid decarbonisation if global climate objectives are to be achieved;
3. To provide a low-cost decarbonisation solution in some sectors and geographies where CCUS is economically advantaged relative to other decarbonisation options locally, or captured carbon could be a useful input to a product.

CCUS and the path to net zero

The ETC's report assesses the roles which CCUS must play on the path to net zero and what must happen to ensure it can do so, noting that CCUS can be technically reliable – achieving CO_2 capture rates of 90% and above, and securely locking up carbon for long durations. This can be achieved at costs which enable it to play an economically valuable role on the path to net zero.

However, the current pace of development of CCUS is far short of what is required. Today, just 40 Mt/year of carbon dioxide is captured, from around 30 facilities. This reflects past confusions about where CCUS is most needed, inadequate investment, and controversies which have generated public opposition. A combination of private investment and supporting public policy is required to ensure that CCUS can play its vital but limited role going forward, the report says.

Early deployment in the 2020s is essential to achieve sufficient capacity by 2050 and reduce overall costs. Much of the growth – particularly of direct air carbon capture (DACC) – will occur after 2030, but significant development in the 2020s is needed to make this future build-out feasible.

A plausible but ambitious deployment trajectory could see 0.8 $GtCO_2$/year of carbon capture capacity operating by 2030 across a suite of technologies, at more than 300 facilities. Achieving this will require action from governments and industry to reduce project development time, develop shared transport and storage infrastructure and ramp up investment.

> “Collective action is needed now to ensure that CCUS can scale up.”

The total investment in CCUS infrastructure is estimated at up to US$5 trillion by 2050. In the next decade, the bulk of the investment (90%) will be spent on point source capture, transport and storage, only circa 10% will be DACC related. DACC investments will however ramp up in subsequent decades.

The majority of CCUS costs are in CO_2 capture and typically reflect the concentration of CO_2 in the gas stream, with more diffuse sources (e.g. air) requiring more energy to isolate the CO_2 than higher concentration sources (e.g. fossil industrial processes). The private sector can finance most of the costs, with both industry and governments playing a role in developing incentives (e.g. carbon pricing, low-carbon products), and developing shared transport and storage infrastructure via industrial hubs.

Critical actions

Collective action by government, corporates and investors is crucial to achieving the scale of CCUS needed in the next decade, the report says. Six critical actions in the 2020s are:

1. Overcoming the green premium to make CCUS deployment economically viable through e.g. carbon pricing, early-stage financial support where needed, scaled through a combination of government and industry mechanisms (e.g. low-carbon product standards, buyer coalitions, procurement mechanisms).
2. Developing enabling infrastructure such as shared transport pipelines and storage sites. Government and industry can develop CCUS hubs that enable economies of scale.
3. Targeting R&D and deployment support towards high capture, next-generation CCUS technologies, as well as developing innovative business models, such as Carbon Capture as a Service.
4. Regulating and managing risks to ensure responsible and secure CCUS development by assigning long-term responsibility for storage sites and meaningful penalties for leakage.
5. Setting standards and regulation to ensure high CO_2 capture rates, alongside developing transparent, best-practice monitoring of CCUS.
6. Building public support for CCUS' appropriate role as a low-carbon technology by articulating a clear strategic, but limited, role for CCUS, and transparency on performance. ■

https://www.energy-transitions.org/publications/carbon-capture-use-storage-vital-limited/

KROHNE Group launches Rapid Spares service

TO SUPPORT CUSTOMERS with fast replacements for failed items, KROHNE Group has launched a Rapid Spares service for customers of their PipePatrol leak detection system solution that provides access to pre-defined spare parts for Pipeline Management Solutions. This even includes spares that need to be pre-configured to match the failed item, such as server components. Rapid spares are stored in KROHNE facilities for delivery to site on the next business day.

Image credit: KROHNE Group

The service will provide access to spare parts for Pipeline Management Solutions.

"KROHNE has spent the last 100 years delivering creative solutions to our industry partners and customers. Rapid Spares is simply the latest iteration of this, coming at a time when we need to be managing closely resources and revenues in order to protect the 3 Ps of people, planet and profit. KROHNE ensures that our valued clients have one more reason to rely on our solutions," said Frank Janssens, vice president, KROHNE Middle East and Africa.

The new Rapid Spares programme also offers the flexibility for the customer to choose from different replacement options: within three months after arrival, the customer can decide whether they want to keep (and buy) the spare, or return it to KROHNE.

Strengthening collaboration on sustainability

ABU DHABI NATIONAL Oil Company (ADNOC) and TotalEnergies have signed a strategic partnership agreement to deepen their long-standing association and explore new opportunities for growth across the energy value chan.

Under the terms of the agreement, ADNOC and TotalEnergies will explore opportunities to collaborate in areas of mutual interest including in gas growth, carbon capture utilisation and storage (CCUS) and trading and product supply.

HE Dr Sultan Ahmed Al Jaber, minister of industry and advanced technology and ADNOC managing director and group chief executive officer said, "TotalEnergies is a longstanding strategic partner and we are very pleased to build on our successful partnerships through this agreement as the UAE and France strengthen energy cooperation. The agreement offers the potential to accelerate growth and create greater sustainable value for our mutual benefit. We look forward to working with TotalEnergies to unlock the opportunities presented by the agreement across the energy value chain to enable more secure, affordable and sustainable energy for our countries and the world."

IOGP releases new well control guidance

THE INTERNATIONAL ASSOCIATION of Oil & Gas Producers (IOGP) has released IOGP Report 608 – *Recommended practice for pore pressure and fracture gradient analysis for well design – construction, intervention, and abandonment.*

The purpose of this recommended practice is to provide information that can serve as industry guidance for the safe planning and execution of well construction and abandonment for prevention of loss of well control. This guidance document aims to define shared language between subsurface and drilling specialists and provide a globally applicable recommended practice for the preparation of PPFG predictions, the definition and communication of associated risks and uncertainties, and real-time PPFG monitoring during well construction, intervention, and abandonment. This recommended practice assists readers with managing the risks associated with loss of well control.

Image credit: Adobe Stock

The new publication addresses the management of risks associated with loss of well control.

This report is available to download from the IOGP Publications Library at https://www.iogp.org/bookstore/

Bunker licence agreement signed in Oman

OMAN OIL MARKETING Company (OOMCO) and SOHAR Port and Freezone have signed a bunker licence agreement for OOMCO to provide marine fuels to vessels visiting SOHAR Port and at the anchorage area.

The bunker licence will see OOMCO operate the 10,000mt bunker barge MT ALPHA (IMO 9286451) to enhance the position of SOHAR Port as the port of choice in the region for vessel owners and operators requiring bunkering services by improving turnaround times and maintaining supply chain efficiency.

The bunker barge is capable of supplying all low sulphur fuel-compliant marine fuels, in line with IMO 2020. Fuels available will include very low sulphur fuel oil (VLSFO) 0.5% and low sulphur marine gas oil (MGO) 0.1% and high sulphur fuel oil (HSFO) 3.5% at delivery rates up to 1,000 cu/m per hour.

Image credit: SOHAR Port and Freezone

The contract signing.

Tarik Al Junaidi, chief executive officer, OOMCO, commented, "We are very pleased with the performance of our bunker equipment and team, and we look forward to utilising our capability and resources to supply SOHAR Port and Freezone. This bunker license represents an important joint effort to work together to further boost Oman's logistics sector and contribute to the national economic diversification efforts."

Omar bin Mahmood Al Mahrizi, chief executive officer, SOHAR Freezone, said, "We have been very pleased with the quality, safety and speed of the service offered by OOMCO and we are delighted to continue this relationship by working together. This will serve to strengthen Oman's shipping and logistics sector as demand for high-quality and regulatory-compliant bunker fuels increases in the future."

SOHAR Port and Freezone says the bunker fuel market in the Middle East and Africa region is expected to grow at more than 12% during the period of 2022-2025.

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Milaha wins Qatar EPCI contract

MILAHA, THE INDUSTRY-LEADING provider of maritime and logistics solutions in Qatar, has announced a significant five-years contract award with an option to extend, for delivering Engineering, Procurement, Construction, and Installation (EPCI) services for offshore projects in Qatar.

Image credit: Adobe Stock

Milaha is a leading provider of maritime and logistics services in Qatar.

Eng. Mohammed Abdulla Swidan, Milaha's PCEO, commented, "We are delighted to have been awarded this contract by QatarEnergy, which represents the largest single contract in Milaha's recent history, and that will further cement our name as reliable service provider and partner-of-choice for Qatar's major oil and gas development projects.

"I would like to take this opportunity to thank QatarEnergy for their confidence in the effective cooperation and partnership that we are proud of. Winning this contract demonstrates our ability to deliver with our partners on a localisation strategy of value-added subsea and topside engineering and construction services with highest health and safety standards," he added.

Milaha has been executing a strategy to further develop its capabilities in serving the major oil and gas projects in Qatar especially in the fields of Inspection, Repair and Maintenance (IRM) services, which will contribute to the 'Tawteen' programme objectives aimed at localising and enhancing the energy sector's supply chain.

Worley awarded Aramco contracts

WORLEY HAS BEEN awarded two project management service contracts for Aramco's unconventional gas programme in North and South Arabia and Jafurah.

Under the contracts, it will provide front-end engineering design (FEED), detailed design support, project management services and construction management services. The term of both contracts is three years with an option for an extension for a further two years. Worley will carry out the work from their Al-Khobar and Houston offices.

"Being part of a project that not only looks towards sustainability but also contributes to boosting regional economy demonstrates Worley's commitment to developing future growth in the location," said Eissa Aqeeli, senior vice-president and location director, Saudi Arabia and Bahrain.

Jafurah is the largest unconventional non-associated gas field in the Kingdom, with an estimated 200 trillion standard cubic feet of gas in place, and is a key component of Aramco's unconventional gas programme, with capital expenditure at Jafurah expected to reach US$68bn over the first 10 years of development.

PSC to allow increasing investment in Algeria

ENI, SONATRACH, OXY and TotalEnergies have signed a production sharing contract (PSC) which will see the partners increase investments into the country. The PSC was signed for blocks 404 and 208 in Algeria which are located onshore in the prolific Berkine basin, in eastern Algeria.

Image credit: eni

The contract signing.

The contract, signed under Algeria's new hydrocarbon law of 2019, will allow the partners to boost investments, increasing the fields' hydrocarbons reserves while extending their production life for further 25 years. It will also enable future valorisation of significant quantities of associated gas which might become available for export, contributing to the diversification of gas supplies to Europe. The agreed plan of activities will also include new technologies to improve the reserves recovery factor and reduce CO_2 emissions through energy efficiency and decarbonisation projects.

Eni CEO, Claudio Descalzi, commented, "Through this new contract, additional volumes of gas will be made available for export and for the domestic market, coherent with Eni's commitment to the energy transition. It also highlights the importance of the strategic partnership with SONATRACH, aimed at long term investments in Algeria to maximise asset value."

Ipieca introduces new principles for membership

IPIECA, THE GLOBAL oil and gas association for advancing environmental and social performance across the energy transition, has made support of eight Ipieca principles a new condition of membership.

They are grouped under the association's four strategic pillars of climate, nature, people and sustainability. Each thematic area includes two principles – while the first provides support for a United Nation's convention or initiative, the second is designed to advance the environmental and social performance of Ipieca member companies' operations.

Climate principles

1. Support the Paris Agreement and its aims.
2. Advance emissions reduction and innovation, and enable adoption of low-carbon products and solutions across oil, gas and/or alternative energy.

Nature principles

3. Support the aims of the UN convention for biological diversity.
4. Responsibly manage operational impacts on the natural environment and ecosystem services.

People principles

5. Support the UN guiding principles on business and human rights.
6. Promote the health, wellbeing and social inclusion of workforces and local communities relating to operations, and contribute to the development of host communities and countries.

Sustainability principles

7. Support the UN 2030 Agenda for Sustainable Development as embodied by the Sustainable Development Goals.
8. Integrate sustainability across activities, increase transparency and engage with key stakeholders.

Setting sustainability expectations for its members, the Ipieca principles demonstrate the association's commitment to working with members and stakeholders to lead the global oil, gas and alternative energy industry through a sustainable energy transition.

Morten Mikkelsen, Ipieca chair, said, "The Ipieca Principles demonstrate Ipieca's commitment to working with members and stakeholders to lead the industry through a sustainable energy transition. By setting expectations for members' management approach and providing tangible actions to achieve them, Ipieca is inspiring action on our vision to advance the industry's environmental and social performance and contribution to the energy transition in the context of sustainable development."

The need for future-fit energy super basins

ENERGY SUPER BASINS of the future must fulfill three key criteria – abundant resources, access to low-cost renewables and hub-scale carbon capture and storage (CCS) opportunities, according to a new report by Wood Mackenzie, a Verisk business.

The world's need for sustainable energy is set to change the geography of the oil and gas industry, increasingly entwining it with renewables. Therefore, the upstream industry of the 2030s and beyond must focus on where its synergies with new energies are strongest, according to the energy consultants.

Fewer than 50 traditional super basins supply more than 90% of the world's oil and gas. These are defined as basins originally holding more than 10bn boe resources, of which more than 5bn boe remains. The Middle East accounts for three of the top five traditional superbasins: Rub al Khali (mainly Saudi Arabia, plus Yemen, UAE, Oman) ranks first, Widyan (Saudi Arabia and Iraq) ranks second and Zagros (Iran/Iraq) ranks fifth.

Wood Mackenzie vice president Andrew Latham said, "Of the remaining resources from traditional super basins, only 1,453bn boe or half have been identified as future-fit energy super basins defined as having abundant resources, access to low-cost renewables and hub-scale CCS opportunities.

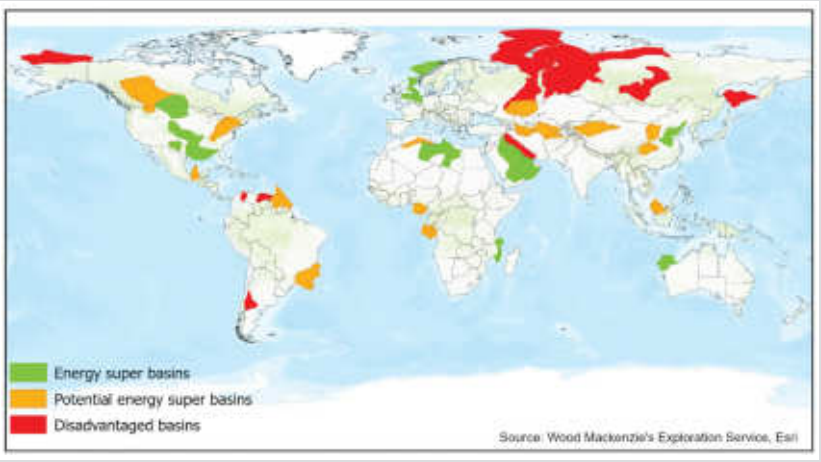


Image Credit : Wood Mackenzie

Energy super basins map.

"The upstream industry of the 2030s will have a different footprint as investment migrates to the new energy super basins. With some basins set to be left behind, the industry will become even more concentrated in its top basins. At the same time, upstream strategies will increasingly merge with low-carbon businesses."

Decarbonising the upstream is the industry's most pressing sustainability task. Electrifying operations using a clean, renewable energy source is one of the fastest and best ways to eliminate emissions. While it is easy to install in new fields and retrofitting old fields could be considered, renewable energy sources need to be plentiful and affordable.

Latham said, "The co-location of low-cost renewables with low-cost oil and gas is key. Surplus renewables can also be fed into the grid as part of the overall energy system."

CCS is the most promising sequestration technology for reducing Scope 3 emissions. It offers the scale to decarbonise difficult-to-abate consumer sectors and could save 18% (with direct air capture) of annual global emissions by 2050. CCS does not need to be in the same basin as oil and gas production, but in practice is unlikely to be located away from upstream operations.

All existing, planned and hypothetical CCS projects add up to just under 1 Btpa CO2e total capacity. These are concentrated in a handful of countries, largely reflecting the location of commercially feasible CO_2 point sources rather than the limited availability of subsurface storage resource.

Latham commented, "We expect global CCS capacity to grow to between 2 Btpa and 6 Btpa by 2050. Our assumption here is that this growth will come mainly from countries that will have hub-scale emissions sources available close to subsurface storage options. CCS operators will offer sequestration as a service to emitters."

Some good examples of future energy super basins include the Gulf Coast and Permian in the US, the Rub al Khali in the Middle East, the North Sea, and Australia's North Carnarvon. However, more work needs to be done as half of the world's remaining resources in traditional super basins are disadvantaged.

Latham concluded, "Recognising the long-term direction of travel presents an urgent call to action. It will take many years, even decades, to fundamentally realign global upstream portfolios with the new energy super basins. First-mover advantage applies. The sooner the transition starts, the better."

Offshore Mediterranean is one of Egypt's main productive basins.

Image Credit : Adobe Stock

Egyptian gas poised for long-term growth

Moin Siddiqi, economist, assesses prospects for Egypt's promising gas sector, and its role in underpinning the country's status as a regional energy exporter.

EGYPT'S ENERGY STRENGTH lies in the natural gas sector, in both upstream and downstream sources of production. The Petroleum Ministry's integrated strategy to develop natural gas resources has yielded the highest rates of production in the country's history, and self-sufficiency in gas. The state-owned Egyptian General Petroleum Corp (EGPC) and Egyptian National Gas Holding Co. (EGAS) control the bulk of the country's hydrocarbon resources.

In geological terms, there are four main productive basins, of which the largest is offshore Mediterranean, followed by the Western Desert, the Gulf of Suez, and the Nile Delta. Each of these regions has played a vital role throughout the country's petroleum history. The jewel in Egypt's crown in this century has been the Mediterranean shelf, which possesses further deepwater hydrocarbons potential.

Egypt holds 77.2tn cubic feet (Tcf) of proved gas reserves, according to bp and the U.S. Energy Information Administration, placing it 16th globally and seventh in the Middle East and North Africa (MENA) region. The government estimates probable reserves at 120 Tcf, much of which lies in deepwater. Achieving proven status for these undiscovered reserves, however, requires increased exploration and development (E&D) spending, advanced technologies, and attracting foreign energy majors. In the 2021/22 fiscal year (ended last June), the energy sector received around US$6bn in foreign direct investment (FDI), according to Minister of Petroleum Tarek El-Molla.

> "Egypt has witnessed a boom in gas production in recent years."

Exploration hotspot

The Government of Egypt encourages international oil companies (IOCs) to participate in the hydrocarbons sector, and currently more than 50 IOCs are operating. They include BG International Ltd (a subsidiary of Shell plc); bp; TotalEnergies; eni; ExxonMobil; Chevron; Rosneft (Russia); Sinopec (China); Mubadala Petroleum (UAE) and KUFPEC (Kuwait), as well as U.S. independents (Noble Energy and Apache) among others, currently exploring on- and offshore Egypt.

Egypt has witnessed a boom in gas production in recent years due to the rapid development of new reserves in the Mediterranean, northern Alexandria, and the Nile Delta. Recent reforms have liberalised the energy market, allowing natural gas exports, which were previously earmarked exclusively for local consumption. The EGPC signed around 83 oil/gas exploration deals with IOCs between November 2013 and February 2020, worth around US$15.5bn. Supermajors ExxonMobil and Chevron entered the upstream sector in 2019 and won additional concessions in early 2020.

After a successful year in 2021, Egypt is expecting between US$7.5bn to US$8bn in E&D investment this year, as local and foreign operators expand their operations, according to the Ministry of Petroleum. Natural gas production is expected to reach 7.2bn cubic feet per day (cf/d) in the financial year 2021/22 (a 10% increase over last year).

Future output should increase substantially thanks to the fast-track development of the Zohr, Atoll, and West Nile Delta projects (see below), thereby meeting robust domestic energy demand, while allowing surplus resources for export in the form of LNG and

Table 1: Egypt's proved natural gas reserves in billion cubic metres

	End-2000	End-2010	End-2020	(%) chg 2000-20	R/P ratio*
	1.4	2.1	2.1	50.0	36.6
As % of North Africa's Total	20.0	27.0	36.2		

**Reserves-to-production ratio, measured by years of E&P activity*
Source: BP Statistical Review of World Energy June 2022
Note: Natural gas accounts for more than three quarters of proved hydrocarbons reserves. Hydrocarbons production is by far the largest single industrial activity in Egypt, representing around 13.6% of GDP in 2018.

pipeline gas. The country possesses the infrastructure for transporting and handling natural gas, with a main network of 7,000 km of pipelines, plus a distribution network of 31,000 km, and 29 gas treatment plants as well as two LNG facilities, the Idku and Damietta plants.

Egypt aims to decarbonise the oil and gas sector as part of the energy transition drive. This year, a Memorandum of Understanding (MoU) was signed between EGPC and Baker Hughes to manage gas flaring and carry out a flare recovery initiative to help recover and reduce emissions in hydrocarbons operations. "As part of Egypt's sustainable development vision, we are actively exploring opportunities that support our strategy of using clean energy and reducing emissions to accelerate our journey towards net-zero," said El-Molla.

Major gas fields

Zohr (discovered in 2015) holds approximately 30 Tcf of lean gas; Atoll (1.5 Tcf of gas plus 31mn barrels of condensates); Abu Madi-El Qar'a; Abu Qir/North Abu Qir; Badreddin; Port Fouad Marine area; Raven; Giza; Fayoum; Nooros; Shukheir; Temsah; Wakar; and the West Nile Delta (WND) development. The latter includes five gas fields across North Alexandria and West Mediterranean Deepwater offshore concession blocks.

The full-scale development of the Zohr field (equivalent to the total reserves of Uzbekistan) and the biggest find to date in Egypt and the Mediterranean Sea, entails drilling 254 wells over the field's life-span at an estimated cost of US$12bn. The reservoir has further upside potential at the deeper Cretaceous target. The big three gas fields (Zohr, West Nile Delta and Atoll) boast the capacity to produce more than 5.5bn cf/d, representing more than US$30bn worth of investments over the coming years.

> "Egypt aims to decarbonise the oil and gas sector as part of the energy transition drive."

A series of gas discoveries over the past decade has returned the nation to gas self-sufficiency and a net energy exporter. Egypt's natural gas exports in the financial year 2021/22 were reported at 7.5mn tonnes.

Energy diplomacy

Egypt has the potential to become a prominent LNG exporter given its untapped gas liquefaction capacity and closer commercial and bilateral ties with the European Union (EU). With France, Italy, Greece and Cyprus each having strategic stakes in Egypt's progress, the country's efforts to establish itself as a leading LNG exporter is a matter of significance for the EU's foreign policy, especially given the current geopolitical environment.

Egypt has unutilised gas liquefaction capacity through the Shell Idku facility (7.2mn tonnes per year) and Eni Damietta plant (5mn tonnes per year). This represented 15.2% of the EU's LNG imports (80mn tonnes) in 2019, according to the European Commission. Egypt is seeking an increased role in meeting Europe's gas needs, which in the aftermath of the Ukraine war, intends to diversify its mix of suppliers and reduce dependency on Russia, which last year accounted for 40-45% of the EU bloc's gas consumption through pipelines.

The country's close geographical proximity to both Cyprus and Israel, which also aspire to export their surplus gas production to Europe, encouraged the conclusion of agreements between each of them and Egypt. These agreements state that Cyprus and Israel will export surplus natural gas to LNG complexes in Idku and Damietta for liquefaction and export to European markets.

Egypt plans to use imported gas for domestic use and re-export to global markets through its LNG facilities on the Mediterranean coast. A key target is to connect the Cyprus offshore gas field, Aphrodite, with

Egypt's LNG plants by building a subsea pipeline between the two countries. While under the 'Egypt-Israel' agreement, the latter started exporting gas to Egypt from the Leviathan and Tamar fields (since January 2020) via the subsea East Mediterranean Gas pipeline. The flow of gas (64bn cubic metres/day), authorised for 15 years, will serve both domestic and export markets via Egypt's LNG terminals. Israel's proven natural gas reserves are 20.8 Tcf (bp data). The EU plans to encourage European companies to bid for Israeli and Egyptian exploration tenders.

Egypt's own offshore and onshore gas reserves are commercially viable to increase LNG liquefaction capacity to well above 12mn tonnes per year.

Arresting depleting oil capacity

A booming gas sector has compensated for the decline in crude oil output from a peak of 950,000 bpd in 1995 to 608,000 bpd by late 2021 – thus reflecting steadily depleting yields from matured oilfields (notably Badri, Belayim, Marina, and Ras Budran). Operators are trying to slow the natural decline in production from ageing fields through significant investments in enhanced oil recovery (EOR) and boosting exploration. Nonetheless, Egypt still ranks the largest (non-OPEC) producer in Africa.

Meanwhile, proved oil reserves (3.1bn bbl) as of late 2020 were down 4.5bn bbl from 2010. The EGPC hopes that greater investment in exploration could lead to more discoveries. This year, Dragon Oil (UAE) reported one of the biggest finds in the Gulf of Suez, which could contain 100mn barrels of oil. Egypt recently made amendments to oil extraction agreements with IOCs, which could result in US$5bn of new investment over the next three years, while expanding oil production by 100,000 bpd.

Downstream sector

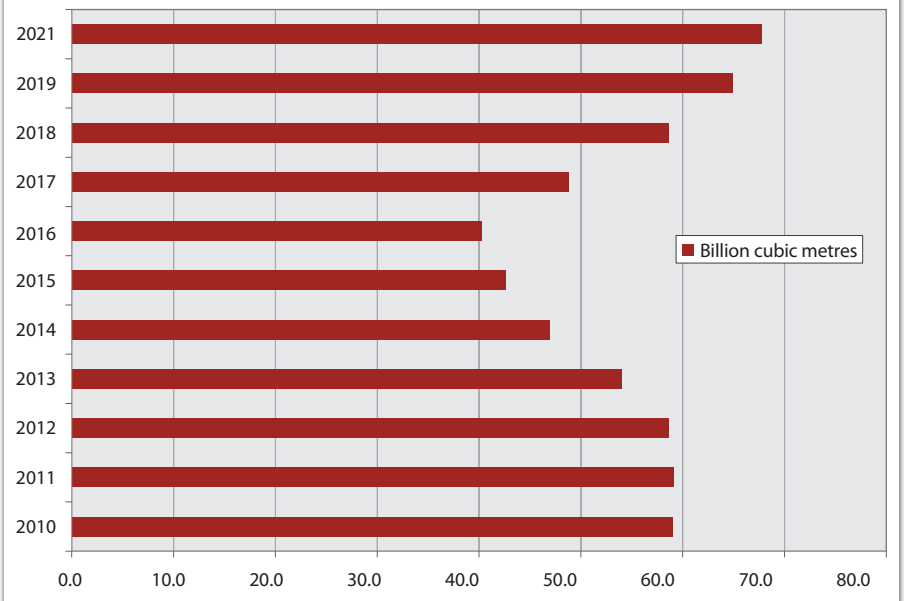
Gas monetisation through petrochemical expansions will have a positive impact on economic development. By 2023, Egypt aims to reach self-sufficiency in petrochemicals products. In the financial year 2021/22, output from the petrochemicals industry exceeded 4mn tons – with exports rising 45% to around US$6.7bn (on yearly basis), according to the Egyptian Petrochemicals Holding Co. (ECHEM). The sector represents around 12% of industrial production, or 3% of gross domestic product (GDP).

Egypt plans to invest some US$38bn on mega-projects over the medium-term, with aims of becoming a hub for petrochemicals in the MENA region. A key integrated project is the Red Sea refining/petrochemical complex in the Suez Canal Economic Zone (costing an estimated US$7.5bn). Once online, it will add 3.7mn tonnes per year of diverse products such as polyethylene, polyesters, polypropylene and bunker fuel.

The credit rating agency Fitch Solutions noted that new petrochemicals projects underway would enhance Cairo's resolve to be a regional hub for oil and gas trade, given its strategic location. "The Egyptian economy is likely to achieve sustainable growth with the change of policies from imports to exports," said Fitch Solutions.

> "Growing gas resources underpin Egypt's status as a regional energy exporter."

Figure 1 : Egypt's gas production in billion cubic metres



Egypt is the fifth largest gas producer in Middle East & North Africa after Iran, Qatar, Saudi Arabia and Algeria. Source: BP Statistical Review of World Energy June 2022

Conclusion

Egypt remains the fourth largest gas consumer in the MENA region, after Iran, Saudi Arabia and the UAE. Its 2021 consumption was reported by bp at 61.9bn cubic metres. The country of over 100mn people relies on natural gas to generate nearly three-quarters of power for households and industries. The gas sector is important for new cities under construction, such as the New Administrative Capital and New Alamein. The main gas networks will supply the populations and industrial areas with clean energy needs and contribute to providing basic infrastructure services.

The country is ideally placed to optimise gas supply both for a large domestic market, to fulfil the needs of its population as well as for value-added industrial feedstock, and also for exports through both pipelines and LNG, enhanced by its proximity to European and Middle Eastern markets. Furthermore, Egypt is capitalising on its strategic location, well-developed energy infrastructure, and sizeable discoveries in the Eastern Mediterranean to consolidate its position as a regional energy hub. Amid depleting oil capacity, growing gas resources underpin Egypt's status as a regional energy exporter for the foreseeable future. ■

CGG awarded seismic imaging contract

CGG HAS BEEN awarded a project by bp and JV Partner Pharaonic Petroleum Co for the 3D seismic imaging of the first OBN survey ever conducted in the Nile delta, covering the Atoll and Atoll North fields.

CGG will apply its OBS & FWI imaging technologies, expertise and specialised HPC from its UK and Cairo imaging centres to deliver the highest-quality 3D seismic images of pre-Messinian targets with greater velocity model detail, image bandwidth and AVO reliability for improved field development planning and near-field exploration.

Peter Whiting, EVP, Geoscience, CGG, said,"This new 3D OBN imaging project is the first of its kind in the Nile delta. With our in-depth geological knowledge of the region, and our industry-leading OBS imaging technology, I have every confidence in CGG's ability to deliver the best possible subsurface insight to bp and joint-venture partners at Atoll.

Subsea developments will benefit from localisation at scale.

Image Credit: Adobe Stock

Connecting opportunities and **ambitions**

Localisation is at the heart of Baker Hughes' strategy in Egypt to maximise returns and ensure efficiencies across the entire Mediterranean basin.

THE GLOBAL REACH and integrated supply chains of the energy industry are most powerful when built on the long-term partnerships and economic commitments of a meaningful localisation strategy.

Relationships forged early at the sharp end of an energy development project benefit the projects of both today and tomorrow by building local capabilities, supporting the formation of crucial infrastructure, tailoring the relevant suite of technologies and maximising efficiency.

The strategy is, at its core, about establishing a long-term commitment to a country and region, an approach designed around a 'here to stay' mentality that creates deep collaborative partnerships that extend well beyond the standard customer-contractor relationship.

Subsea developments, not just in Egypt, but across the entire Mediterranean basin, will benefit from localisation at scale, with all that means in terms of maximising the positives and overcoming challenges across the entire region.

"There is a huge opportunity across the Mediterranean and beyond to tap into the benefits of true localisation that we have established in Egypt," said Baker Hughes. "We believe wholeheartedly in the upside of investing in individuals, in infrastructure and in relationships. This is as far from old-school 'one project and done' as you can get."

> "Egypt already represents a significant centre of expertise in terms of subsea oil and gas."

Laying down roots

Egypt already represents a significant centre of expertise in terms of subsea oil and gas. Baker Hughes has engineers from the country working in operations across India, Australia, Indonesia, Ghana, Ivory Coast, Scotland, Brazil, North America, and Mozambique.

For a landmark project in the latter, local manufacturing supported by Baker Hughes supplied subsea structures totalling more than 6,500 tonnes and representing more than US$50mn in investment – securing qualifications to global standards and opening the door to new markets.

Further expansion is on the horizon with plans progressing for what would be a significant investment to support subsea operations and software engineering in the Mediterranean and globally. Another key development would provide optimised solutions to independent oil company investors and their development plans in the region.

"We have a track record of building directional, customer-focused, and locally-nurtured relationships around the world," said a spokesperson for Baker Hughes.

"For projects and developments as well as for regulators and local interests it is proof positive of our commitment to long-term engagement. This is about partnerships in collaboration, rather than simply as a contractor."

The company added, "It is hard to overstate the commercial benefits: the tailored experience of the local talent base, the efficiencies in terms of transport and logistics, the streamlined management structure. The positives just keep coming."

Sea of opportunity

Ambitions for development across the Mediterranean region are significant and growing; a market in excess of 200Tcf of gas and associated condensates, in addition to a number of significant recent geopolitical gains, are among the headline positives.

With less than 50% of reserves sanctioned for development, there is plenty of work still to do, and a huge opportunity to grasp – extending to the Black Sea, Red Sea and Arabian Gulf. High-profile operators in the region include BP, Shell, Chevron, ExxonMobil and TPAO, among many others.

Further, as Baker Hughes exemplified for Eni's important Zohr project, there are many long-term benefits to be garnered through a commitment to localisation.

"This is about a delivery approach focused on the Mediterranean: wing to wing delivery, early engagement and front-end enablement on a regional basis – even extending to associated regional and international service and offshore provision," said the company.

"We are uniquely positioned with the required breadth of capabilities to provide customers with peace of mind from exploration through execution and operations – Baker Hughes is all about deep partnerships that are outcome driven, and committed throughout to localisation."

Engagement on that scale will, Baker Hughes believes, produce a central hub for early-stage feasibility, systems engineering, sales and commercial realisation. The strategy will further produce potent and integrated partnerships across engineering and fabrication, including in key areas such as long offset /deep gas tie-backs, and leading to robust cooperation across SURF and installation.

> "The strategy will further produce potent and integrated partnerships across engineering and fabrication."

A commitment to the region also facilitates a closer relationship between the specific technologies required to maximise the potential of Egypt and the Mediterranean and the ability to optimise design, manufacturing and operations. Of particular importance in this context are control systems, large-bore gas valves, and deep-water subsea productions systems.

At Baker Hughes, this includes pipeline systems built around a patented Open PLET design that optimises S-lay operations and integrated PLEM solutions. Also important are the company's proven experience with large-bore gas operating systems, streamlined fabrication, and pipeline connection systems up to 42 inches. Subsea Control Systems, meanwhile, include long step-out technology that provides subsea to beach capability, along with high-speed comms and HV power distribution. Additionally, large-bore XT systems include pre-engineered, modular 5 and 7-inch configurations with high flowrates and enhanced erosion capacity, as well as pre-configured wellhead interfaces.

A commitment to the region facilitates region-specific technology development.

Image Credit: Adobe Stock

Commitment and reward

The building blocks of any global strategy, however ambitious, are the relationships forged on the ground, the partnerships and collaborations developed and deepened by working together over time – and despite challenges – to achieve a common aim.

The expertise, experience and engagement that results from those connections is at the heart of what localisation is all about; and for companies such as Baker Hughes, it is why so much value and emphasis is placed on developing infrastructure and capabilities across multiple global markets.

"The benefits of our approach not only reinforce existing capabilities within a given country or region but also build new capacities across the company, whether commercial, economic or in sales," said Baker Hughes.

"Our strategy provides our customers with a direct connection to the talent that is around them, it provides confidence to partners, regulators and investors of our commitment to long-term engagement, and – crucially – underscores our dedication to relationships built on collaboration rather than simply on contracts."

The approach is what drives Subsea Connect, which leverages Baker Hughes' decades of experience and the industry's biggest installed base to enhance production, maximise recovery over the life-of-field and reduce the total cost of ownership – all through an integrated approach to subsurface, subsea, surface and EPCI to ensure optimal solutions from day one.

It is just one reason why the opportunities represented by Egypt and the Mediterranean, together with the skills and technological expertise inherent in companies like Baker Hughes, are potentially so game-changing.

Customers will not only benefit from a supply chain built on trust, engagement and investment, but will be assured of a partner – from the very earliest stages of a project or development – dedicated to long-term ambitions and wide horizons.

"Localisation is all about a commitment to supporting this industry – by engaging at the earliest possible stage, by applying the proven expertise of our company, by leveraging the power represented by our diverse teams, and by expanding the capabilities and footprint of our supply chain excellence," the company's statement concluded. ■

Qatar enters new era of **expansion**

A massive upgrade of Qatar's oil and gas sector is gaining momentum as the tiny Gulf state looks to shore up its position on the world energy map. Martin Clark reports.

QatarEnergy has signed partnerships with leading IOCs including Shell for the development of the NFE project.

Image Credit: QatarEnergy

THESE ARE BIG times for Qatar as it gears up not only to host the Fifa World Cup later this year, but as it doubles down on its mighty gas exports.

The tiny Gulf state has long been the world's leading producer of liquefied natural gas (LNG) but it is now looking to almost double its sales amid a massive new expansion drive. This will see LNG capacity grow from 7mn tonnes per annum (mtpa) to 126 mtpa over the coming decade. There is plenty of appetite for the product as well, with Western buyers unable to access Russian gas amid the war in Ukraine, which has opened doors for alternative suppliers. Qatari officials are keen to lock in long-term deals with new customers and markets as it rolls out the next wave of production capacity.

In recent months, QatarEnergy has been assembling a star-studded team of investors to support it in what is perhaps the grandest energy development of our time, and certainly the single largest project in the history of the LNG industry.

> "QatarEnergy has been assembling a star-studded team of investors."

Landmark project

Most recently, Shell was selected as a partner in the North Field East (NFE) expansion project. It will hold a 25% share in a joint venture company which will own 25% of the US$29bn NFE project, including the four mega LNG trains with a combined nameplate capacity of 32 mtpa.

Shell joins other notable investors in the project, including TotalEnergies, Exxon, ConocoPhillips and Eni – all selected by QatarEnergy in the past couple of months.

A second phase – North Field South (NFS) – will eventually include a further two LNG trains to take overall liquefaction capacity to 126 mtpa.

On joining the NFE team on 5 July, Shell's CEO, Ben van Beurden, called it a "landmark project" that will help provide the LNG the world urgently needs with a lower carbon footprint. Shell already holds multiple partnerships with Qatar, including the flagship Pearl GTL complex, the world's largest gas-to-liquids plant.

As well as impressive in its sheer scale, the whole NFE strategy embeds key environmental technologies such as carbon capture and sequestration to reduce emissions. This is becoming an integral theme across the Gulf's vast energy sector, with QatarEnergy recently joining the Aiming for Zero Methane Emissions Initiative that aims to reach near zero methane emissions from operated oil and gas assets by 2030.

Minister of State for Energy Affairs, Saad Sherida Al-Kaabi, who is also the president and CEO of QatarEnergy, said it reaffirmed the nation's commitment to the climate change agenda "and its unwavering support to the global effort to reducing emissions, including methane." It also falls in line with QatarEnergy's recently announced sustainability strategy and follows key steps that include signing the guiding principles on reducing methane emissions across the natural gas value chain and endorsing the Global Methane Pledge.

Another major milestone on the NFE project was achieved in April after QatarEnergy awarded the highly-prized engineering, procurement, and construction (EPC) contract.

This went to the TR-Wison joint venture between Técnicas Reunidas S.A. of Spain and China's Wison Engineering. The contract also includes options for the NFS project, as well as any future requirements for the handling, storage and loading of sulphur.

At the same time, Qatar is bolstering its gas tanker fleet as it gears up to transport more products to the global market. QatarEnergy this year signed a series of time-charter parties (TCP's) with a subsidiary of Mitsui OSK Lines (MOL) for the long-term charter and operation of four LNG ships, constituting the first batch of TCPs awarded under a massive LNG shipping programme.

"These contracts mark the start of the construction phase of QatarEnergy's historic fleet expansion programme in support of our LNG expansion projects," said Sherida Al-Kaabi.

"We are pleased to be working with our reliable business partners from China and Japan, namely: MOL, Hudong, and CSSC to take this important step together."

LNG is not the only large-scale project activity underway in Qatar, however, as the country seeks to add further value to its hydrocarbon sector via other avenues. The early site works contract for the Ras Laffan Petrochemical Project (RLPP) was recently awarded to Consolidated Contractors Company (CCC) after the completion of front-end engineering and design (FEED) work in 2021. CCC will now prepare the site for the new facility within Ras Laffan Industrial City under a lump-sum contract, after which an engineering, procurement and construction (EPC) contract is expected to be awarded.

Image Credit: Adobe Stock

Ras Laffan Petrochemcial Project is part of Qatar's efforts to expand and diversify its business portfolio and implement world-class downstream projects.

RLPP will feature a 2,080 kilo tons per annum (KTA) ethane cracking unit, making it the largest ethane cracker in the Middle East and one of the largest in the world.

It will also include two High-Density Polyethylene (HDPE) units, which will significantly raise Qatar's current polyethylene production capacity by approximately 64%. The facility is expected to commence production in 2026, in a project that teams QatarEnergy with Chevron Phillips Chemical Company (CPChem). Sherida Al-Kaabi said the scheme is part of Qatar's efforts to expand and diversify its business portfolio and implement world-class downstream projects.

Oil developments

Though overshadowed somewhat by the gas sector, Qatar's oil industry is also entering an exciting new phase too, with the ongoing development of the offshore Al Shaheen field, 50 miles north of Doha. In June, McDermott International was awarded a FEED contract by North Oil Company (NOC) – a JV of Qatar Petroleum and Total – for the Ruya Development, previously referred to as Al-Shaheen Phase 3-Batch 1. The US company hailed it as one the largest FEED projects undertaken in its history and follows the successful completion of a pre-FEED contract.

"This is a game-changer for McDermott as it represents the largest offshore FEED we have ever received in the Middle East," said Tareq Kawash, McDermott's senior vice president, offshore Middle East.

The scope of the contract comprises developing FEED studies ahead of an engineering, procurement, construction, installation and commissioning (EPCIC) project, with work to be led from McDermott's Doha operating hub. It also highlights the scale of Al Shaheen, one of the largest and most complex oil fields of its kind in the world. Production commenced in 1994 and is now at 300,000 bpd, representing almost half of Qatar's oil production. A separate contract has also been awarded to South Korea's DSME for an offshore crude oil production platform that will likewise play a part in boosting output. This project is scheduled to be completed in the second half of 2023.

International expansion

Further afield, Qatar is also raising its profile in the upstream intentional oil and gas business, with a series of high-profile investments, from Africa and Asia to the Americas. For some of the economies it is now operating in, its work could bring with it a transformational impact.

QatarEnergy made a number of notable offshore oil and gas discoveries at the start of the year, for example, in Namibia's Orange Basin, in southwestern Africa. The company holds interests in four Namibian offshore blocks, covering a total area of approximately 28,000 sq km. The potential long-term impact is significant given Namibia's current dependence on imported energy. ■

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Positive outlook for Middle East pipelines

Ben Wilby, senior analyst, Westwood Global Energy Group, looks at the outlook for the Middle East onshore pipeline market.

COMPARED TO THIS point last year, pipeline demand is in a very different place. Global pipeline activity has already started to increase as countries look to diversify their energy supply, both in location and product. The Middle East, already expected to be a bright spot for activity, looks to be in an even better position for pipeline demand, with higher commodity prices supporting ambitious plans.

Between 2022 and 2026, Westwood expects around 22,500 km to be installed in the region. Gas pipelines are expected to lead this, accounting for 60% of the total, driven by domestic transmission lines in Iran and new lines to help monetise gas production in GCC countries that have historically focused on liquids. Despite this, new pipelines for liquids are expected to remain in high demand, with around 9,000 km forecast. Countries such as Iraq and Saudi Arabia are expected to be key drivers of liquid pipeline demand.

Many pipelines are related to raising production at new and existing fields to help meet production targets, which virtually all major energy producers in the region have set. As well as this, some lines are moving forward to support the development of the nascent hydrogen industry, something that countries including Saudi Arabia and the UAE are investing into. Examples of this include the Jafurah project in Saudi Arabia where Saipem has been awarded a construction contract for 835 km of pipelines, including pipelines for hydrogen, natural gas and natural gas liquids. Several countries are also planning to increase their domestic pipeline networks, including Iran, which is expected to lead regional pipeline demand and has multiple pipeline projects of more than 500 km in development. Natural gas will be the dominant product for these lines across the region, including in Oman where Elecnor is constructing a 210 km gas transmission line to meet expected natural gas demand over the next decade.

While domestic pipelines will be dominant, there will be some transmission lines between countries. The Iraq to Jordan pipeline appears to be moving forward once more (although several hurdles remain) and will see more than 1,600 km of pipeline installed over the forecast period should it come to pass.

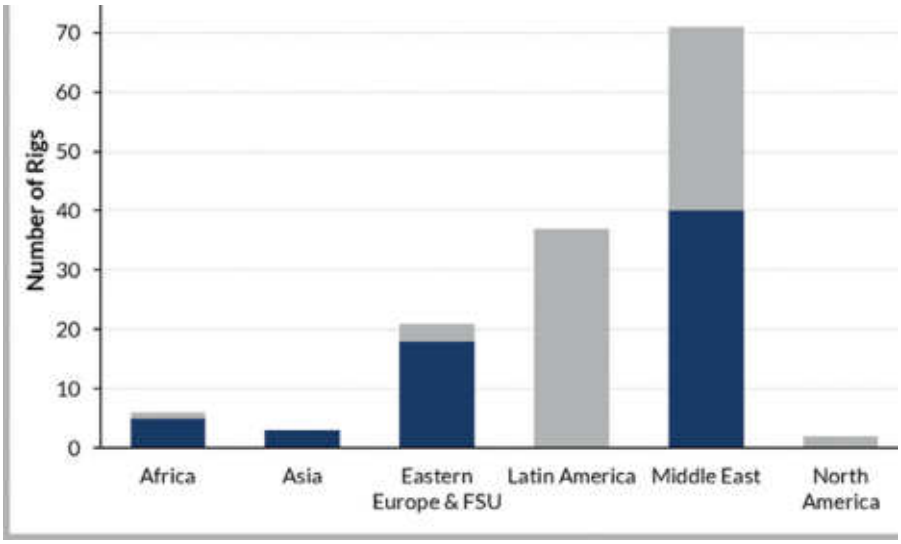

Image Credit : Westwood World Onshore Pipelines Market Forecast

Additional onshore km installations in the Middle East by phase type 2017-2026.

Despite the general positivity around the pipeline market, it is worth remembering that several threats remain. A spike in demand from the oil and gas industry is coming at the same time as supply recovers from the Covid-19 pandemic. As global pipeline demand begins to rise, this could impact the cost of projects, potentially sending them spiralling into uneconomic territory, something that has disrupted the industry in the past. In recent months several projects have been retendered multiple times as operators look to reduce prices, while manufacturers have reported that costs are already 15% higher than last year.

A more region-specific issue is the threats posed by factors unrelated to the industry. While countries in the GCC region are reasonably secure, others such as Iran and Iraq, key countries for future installations, both have risks. Iran remains subject to sanctions, potentially impacting the companies that can take part in pipeline developments, while also reducing the amount of income the country is able to receive from oil and gas exports – essential for the development of new infrastructure. In Iraq meanwhile, despite aggressive production targets of around 8mn bpd by 2027, significant barriers remain. Conflict over the rights to production between the central Iraqi Government and the semi-autonomous Kurdistan region has spiked this year, leading multiple international companies (including Schlumberger) to pull out of the region. At the same time political and social discontent remains high, potentially limiting the ability of the industry to reach its goals.

Despite these concerns however, the region remains a key area for pipeline demand over the forecast period. With growing demand for gas, a continued appetite for liquids and the potential demand for new fuels to support the energy transition (such as hydrogen), the region remains one that pipeline manufacturers and constructers should look to as a bright spot. ■

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Galfar project - Abu Dhabi (UAE)

ILF and DORIS Group win pipeline contract

The pipeline will run both onshore and offshore.

ILF, AN INTERNATIONAL engineering and consulting firm has been commissioned with its Munich office and joint venture partner DORIS Group to carry out the project management consulting (PMC) for the FEED phase II of the 6,000+ km Nigeria-Morocco Gas Pipeline (NMGP).

The Nigeria-Morocco Gas Pipeline (NMGP) is an onshore and offshore gas pipeline designed to bring Nigerian gas to North Africa and as far as Spain for the European market. Upon completion, this pipeline will be the longest offshore pipeline in the world and the second longest pipeline ever.

PMC services include onshore and offshore pipeline and compressor station planning, technical surveying, environmental and social impact assessment (ESIA), land acquisition studies and project implementation framework. The project investigates the potential to use renewable energy sources to operate the pipeline and reduce the project's CO_2 footprint.

"Having already been involved in the feasibility and FEED Phase I of this world-scale project, awarding Phase II to us is a testament to the confidence of our long-standing customers ONHYM and NNPC in our project management excellence and reliability in executing world-class projects," said Carles Giró, area manager Industrial Plants of ILF.

Strohm wins award for TCP solution

STROHM, A LEADING thermoplastic composite pipe (TCP) developer and manufacturer, has won a technology and innovation accolade for its thermoplastic composite pipe (TCP) solution at the prestigious Pipeline Industries Guild Awards 2022.

Strohm impressed the judges with its TCP solution and new innovative fully bonded weight coating designed to keep the pipe steady during the laying process and provide stability on the seabed thereafter.

Phillip Clisham, technical director and the Guild's communication chair said, "Laying subsea pipelines in traditional materials normally means mobilising dedicated pipelaying vessels which is expensive and difficult in some parts of the world. The development of a thermoplastic composite pipe with a unique flexible weight coating which is fully bonded to the pipe that does not affect the bend radius of the pipe enable the pipes to be installed using existing field support vessels.

"The product has already been used on a 2,200 m flowline in Equatorial Guinea, and many other applications are now being considered."

STATS Group grows its presence in the Middle East

STATS Group is capitalising on Middle East opportunities.

PIPELINE TECHNOLOGY SPECIALIST STATS Group has added more staff to its Middle East operations as the result of a post-Covid uptick in project activity.

The Middle East was one of the strongest performing regions for the company in 2021, with revenues increasing from £7.9mn (US$9.5mn)in 2020 to £11.6mn (US$14mn).

In the Saudi Arabian market, the company strengthened its position with the award of a major subsea intervention project and STATS plan to increase their local presence in the Kingdom to support further growth.

In addition to securing a swathe of new contracts in UAE, Qatar, Kuwait and KSA, STATS has extended its master service agreement with Petroleum Development Oman for the provision of pipeline isolation and hydrostatic testing services for a further five years.

STATS is also conducting what is believed to be the world's largest diameter subsea pipeline intervention campaign on behalf of a Middle East client, which involves the hot tapping and isolation of 10 pipelines with diameters ranging from 42" to 56".

The company has relocated Dale Millward, one of its most experienced pipeline intervention experts to Doha as vice president Technical Assurance, in response to the increased demand for STATS products and services, as Qatar makes significant investment in its LNG production facilities.

The importance of leak detection in CCS

CCS IS BECOMING an increasingly important aspect of decarbonisation for the energy industry. Truck and rail transportation methods will be unable to handle the large quantities of CO_2 for CCS to make a significant impact, so the need for pipelines to support these projects is inevitable.

In a blog, Atmos International stresses that it is vital to consider the risks and uncertainties CCS carries, and to have leak detection systems (LDS) to ensure carbon dioxide pipelines are run safely.

Rolling out CCS projects on a large scale will increase the need for effective CO_2 pipeline leak detection for safe operation. The key drivers for CCS include the development of the hydrogen economy and reaching the 2050 climate targets set out in COP26. However, gaps in the infrastructure remain and therefore investment in improving the pipeline networks is likely to be required. The material for CCS pipelines also needs to be carefully considered. CO_2 is corrosive if contaminated with just even a small amount of water, reacting to form carbonic acid. Whether using existing pipelines that are repurposed or specially constructed networks, it is therefore vital that the pipeline infrastructure is engineered to the right standard and that the purity of the CO_2 is closely monitored to avoid the issues surrounding carbonic acid.

Safety is a key concern for CCS pipelines. The CO_2 is either handled as a gas, or a supercritical phase fluid (sCO2) at extremely high pressure. Due to the higher pressure involved in transporting the CO_2, explosive decompression of a CCS pipeline releases more gas, much faster than the equivalent explosion in a natural gas pipeline. The effects of a leak or rupture on a CO_2 pipeline can be catastrophic, both to people and the environment.

Given the number of projects in development and the large scale plans for CCS, pipeline leak detection will play a vital role in detecting and locating leaks in the pipeline as quickly and efficiently as possible. There are a variety of methods that can be used to work with CO_2 both as a gas and as a supercritical phase fluid.

Technologies such as Atmos Pipe and Atmos Wave Flow can help pipeline operators mitigate the risks associated with a CO_2 leak, supporting pipeline operators by accurately detecting and locating pipeline leaks to ensure that they can be handled as quickly as possible.
https://www.atmosi.com/en/news-events/blogs/why-pipeline-leak-detection-is-a-crucial-element-of-carbon-capture-and-storage-ccs/

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Scraper trials and assessments for good pipeline operations

Royal Oil & Gas discusses the benefits of mock pipeline scraper trials and pre-engineering assessments.

EVERY PIPELINE OPERATOR depends upon pipeline scrapers to prove and maintain its pipeline assets' integrity. With each design specific to pipeline features like inline tees, wyes, valves, special connectors, FLETs and manifolds, the mock trial of a pipeline scraper can exponentially reduce the risk of unplanned delays and damage to the pipeline at the time of actual operation in a greenfield project. Even in the case of brownfield projects, mock trials of maintenance scrapers will help reduce the risk of production halt and subsequent need for engagement of emergency teams to recover the asset back into operations using intervention from expensive vessels, crew and equipment.

Thus, considering the severity of risk in using pipeline scrapers without trials, the minuscule investment in a pre-engineering scraping study is a safe and intelligent way forward. Such pre-engineering scraping studies are widely used in offshore pipeline projects in Australia, the UK, Europe and the Gulf of Mexico.

In a typical assessment, mock pipeline features are fabricated onshore in a pipe loop, and proposed scrapers are pumped through the loop to identify any damage or unplanned scenarios. Critical parameters of how the scraper behaves under various flows and pressures are also documented during this operation. Design modifications can be done based on the trial results, and trials are re-conducted until all hazards are proven eliminated by a mock test.

> “The mock trial of a pipeline scraper can exponentially reduce the risk of unplanned delays and damage to the pipeline.”

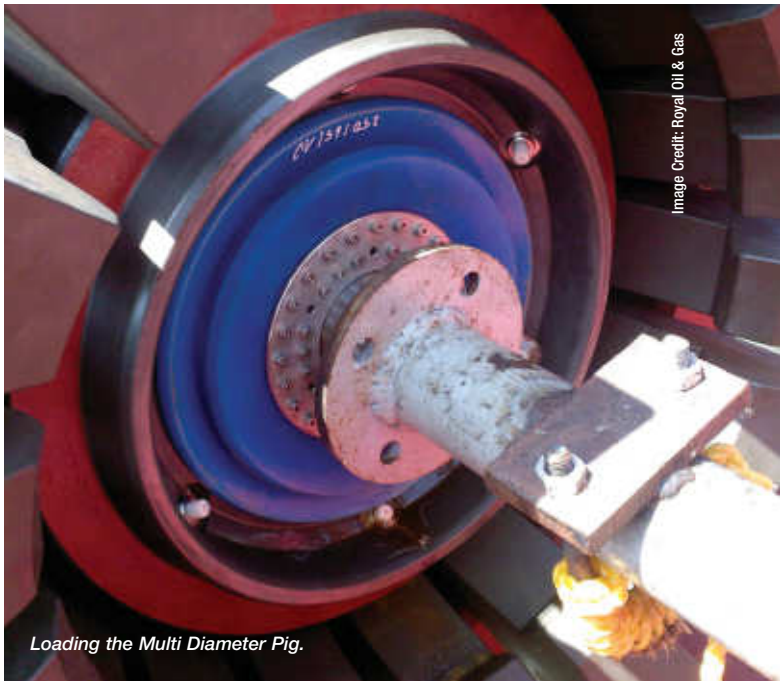


Image Credit: Royal Oil & Gas

Loading the Multi Diameter Pig.

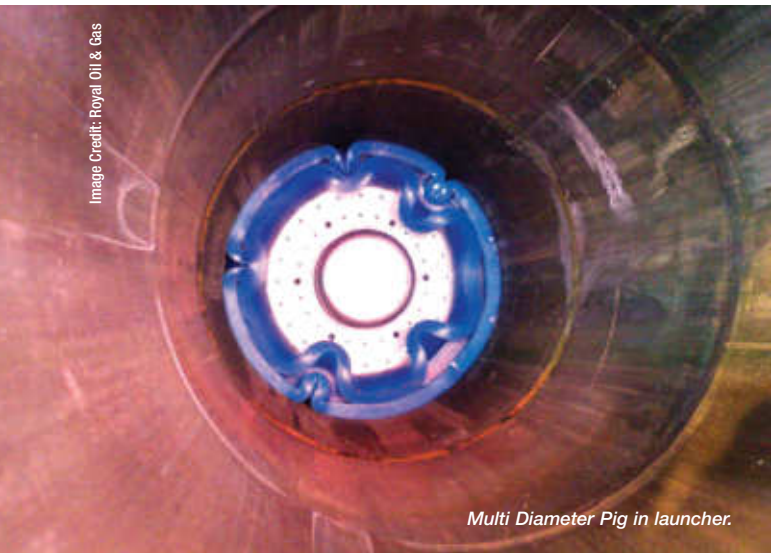


Image Credit: Royal Oil & Gas

Multi Diameter Pig in launcher.

Where the schedule does not allow for a complete mock trial to be conducted, conducting a desktop study of the scraper behaviour through the various pipeline for some theoretical assurance is recommended.

Royal has been part of many desktop studies for pipeline scrapers either stuck in a pipeline or proposed to negotiate tricky ID variations in Qatar, Indonesia and Australia. In collaboration with IK-UK, we were also involved in Gorgon Stage 2 (Australia) Pigging Trials for proving the dewatering scraper tool and blocking scrapers (high friction tools). The pipeline was successfully dewatered as reported by the EPC contractor without any risks and per schedule. ■

To further understand how such an assessment can help mitigate your pipeline scraping risks on your next project, please get in touch with Royal Oil and Gas:
web: https://www.royalmechgroup.com/
email: sales@royalmechgroup.com.
For a piece of friendly advice or chat, please call our local agent in the Middle East and Caspian on +61 (08) 6102 5151.

Acquisition provides a platform for growth

Scott Watters, chief operating officer at Tendeka, explains what's next for the company in the Middle East, following its acquisition by TAQA earlier this year.

Image Credit: Tendeka

Scott Watters, chief operating officer, Tendeka.

Tendeka was acquired by TAQA earlier this year. What impact has this had?

On a day-to-day basis we are still working as normal. Tendeka has a global footprint with ongoing contracts and operations with NOCs, IOCs and independents which need to be serviced. However, from a bigger picture perspective, it is a very exciting time for us all at Tendeka. TAQA sees massive potential for Tendeka in supporting our growth, the deployment of our differentiating technologies, and the acceleration of our new technology development and subsequent commercialisation. The addition of Tendeka provides TAQA with a range of differentiating technologies which impact reservoir performance, strengthening TAQA's technology portfolio. Obviously, we are having a lot of interaction with TAQA personnel during this transition period, and it has all been very positive. I am really excited about Tendeka's future within the group.

Has the acquisition bolstered your operations in the Middle East?

Tendeka already had a strong footprint in the Middle East, except for one key location; the Kingdom of Saudi Arabia. Having the support of TAQA in the Kingdom, with their understanding of the local market dynamics and challenges, will undoubtedly bolster our efforts there. We have field trials underway for some of our differentiating technologies, and numerous discussions ongoing for several others, which, all going to plan, will lead to additional trials in the coming months.

> "The addition of Tendeka provides TAQA with a range of differentiating technologies which impact reservoir performance, strengthening TAQA's portfolio."

Where is most of your ME work coming from? What are the key technologies for the region?

Our key areas of focus are currently in the GCC with Kuwait, Abu Dhabi and Oman, where we have ongoing contracts with the respective NOCs in each of these locations. We also have a long-established presence in Qatar, where we expect activity for us to pick up again in the second half of the year. We have made a big push to progress our business in North Africa since the pandemic and the geopolitical situation has settled down. I see huge opportunities for us in these areas.

From a technology perspective, we are providing almost all our technologies in the region. Our differentiating inflow control technologies such as FloSure AICD, FloFuse and FloCheck are widely deployed in over 200 wells across the GCC and are giving increased reservoir recovery to a number of NOCs. We are the longest serving and probably the largest supplier of swellable zonal isolation technologies regionally. PulseEight, our wireless intelligent completions system, is also gaining a lot of traction, especially the Intelligent Safety Valve (ISV). The ISV's ability to return wells with inoperative SSSVs back to production without the need for an expensive workover during the current high oil and gas price environment offers massive value to operators. The high demand for conventional stimulation in the region means testing is underway on several of our Production Enhancement speciality chemicals, which I am confident will bring a lot of value to operators before the end of this year.

What are the plans over the next 12 months?

Tendeka needs to protect and expand our positions across the region by enhancing our excellent track record and the continued deployment of our differentiating technologies.

Our technologies bring immediate value to operators across the region. The likes of PulseEight, FloFuse and Filtrex are technologies which are unique to Tendeka; this enables us to combat the efforts of the larger service providers to limit our activity.

TAQA will no doubt strengthen our regional position, where we hope to leverage the breadth of their portfolio and resources.

What sets Tendeka apart?

That's a very good question. It would be easy to talk only about our technologies, which are marketing leading, differentiating and provide unique high value add. However, Tendeka is much more than that. The nimble approach our experts take to supporting our clients means we can work in a way that larger service companies cannot or will not do. I believe our focus and attention to our clients is second to none as we bring a more personal approach to the industry. That is why I enjoy working for Tendeka and believe in what we are trying to achieve as a company. ■

A lean, green workover machine

To fill a gap in the decommissioning market, Voll Marintek Limited is pioneering the HWU-150 Lean Machine, a dual jack lifting system with key advantages over rigless operations and MDR to deliver significant cost, risk and climate benefits for the industry.

SPEAKING TO OFFSHORE Network, Dennis Vollmar, CEO of Voll Marintek Limited, explains how he identified an opening in the market.

"So we realised there was a gap by knocking on doors really. We had deep interactions with different operators, service providers and contractors and realised there was space for something new.

"It comes down to knowing well conditions. Wells which are coming to the end of their life are usually decades old and in this time the way data is collected has changed. In many cases you don't even know which revision is the most updated one. In these cases, you have two options: either a customised approach with the deployment of specialised workover units for each subtask or use a rig."

There are drawbacks to both. In the former, rigless workover units require intensive planning, a detailed knowledge of well integrity and, due to their simplicity and dependency on crane support, they are highly vulnerable to unforeseen events and weather conditions. Rigs on the other hand have more capacity and can simplify the planning and execution phase, but generally have a very high spread cost and carbon footprint.

Voll Marintek, therefore, has developed the Lean Machine, a multipurpose unit to fill the void between these two options.

"The Lean Machine is basically a hybrid solution between a hydraulic workover unit (HWU) and a modular drilling rig (MDR). It combines the main features of a HWU such as fast assembly, lightness, compactness and only requires a small footprint in addition to the benefits of MDR such as drilling, milling, making pipe connections respectively handling different pipe types conventionally and in a safe manner."

The dual jack lifting system is a modular adaptable multipurpose unit which has the capacity to be upgraded with additional features so that it can be customised for each project and adapted to various interfaces. It consists of different modules designed to cover a specific P&A task which can be stacked on top of each other, extending the previous operational envelope of the complete system (this is called 'The Happy Meal'). This means it can be upgraded with existing modules at the offshore location to perform sequential tasks instead of mobilising specialised equipment for each subtask or oversized workover rigs.

The operator can choose the options required based on additional costs for each contingency as desired always keeping integrated costs in mind. Importantly, the compactness of the 10 ft container footprint and the lightness of each module (around 12 mt) allow its assembly on a skid beam substructure, heave compensation platform or in a derrick structure of an existing rig.

> "Cost and risk are the main drivers here."

Explaining the benefits of the system, Vollmar comments, "Cost and risk are the main drivers here. When looking at costs for an operation you want to see exactly the expenditure that will be incurred. Often this is not possible without an extensive preparation phase and even then unforeseen circumstances can occur – which is why rigs are often used.

"What we are doing is to see how we can make the whole process lean. So when you know the potential work scopes you need to perform you can configure the machine to it but, if you have the eventuality of making adaptations (maybe to enhance the operational envelope or even downsize it), you can do that in the field and this is where costs can be significantly reduced."

Vollmar claims that the deployment of the modular adaptable unit to tackle challenges within the P&A and decommissioning space will enable the highest potential cost savings available. The faster pipe recovery system alone allows cost savings of US$1mn per well based on a five day execution phase reduction. A global operator has already performed a preliminary total cost analysis in comparison to conventional solutions and identified a cost reduction above 30% for their 100 well campaign.

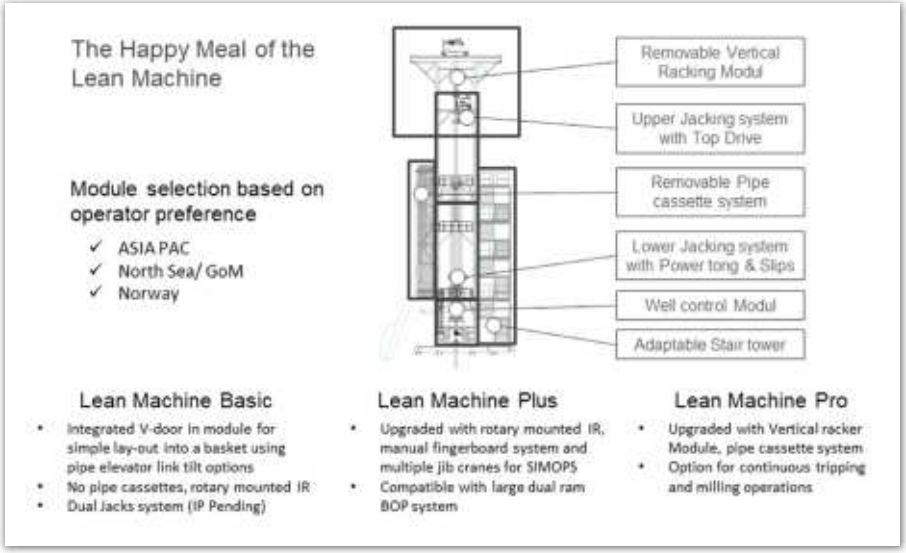
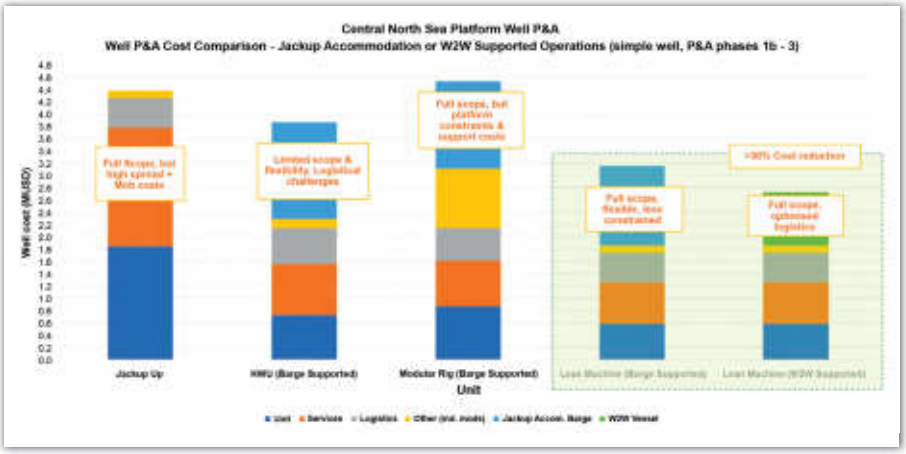


Image Credit : Voll Marintek

Image Credit : Voll Marintek



The high cost of a rig is also mirrored in its high carbon footprint, a somewhat neglected but increasingly pressing concern for the oil and gas industry. HWU's of course have an advantage here, but poor weather, unforeseen events and the mobilisation of additional equipment to cover all P&A phases can bring down operational efficiency and extends the time duration for a P&A campaign – which is not a problem for the Lean Machine.

Mounting market interest

While still at the start of its journey, the Lean Machine is already attracting attention and suitors which is driving it steadily towards commercialisation.

"The interest in regard to decommissioning is operators who see themselves as delay asset management companies and want to change or look at game changers to reduce the cost of decommissioning," Vollmar remarks.

"There is also interest beyond decommissioning, in production enhancement, for example. As oil and gas prices increase, we need to look at solutions which reduce costs and simplify the process. Usually, you can collect wells with the same well challenges which only require wireline (for example) for a campaign. Then you need to get a certain threshold to justify the costs to mobilise other equipment. Our approach gives you the advantage as it is multipurpose and has all this included. You can combine now all the different well interventions and justify the cost much more easily, which obviously increases the recovery factor of mature fields."

The wide application range simplifies wireline, side track drilling, coiled tubing, ESP runs, conductor pulling, life well interventions or slot recovery operations. On top, the dual jacking system reduces operational time by almost 40% and it offers a hoisting capacity up to 250 mt.

For the next steps on its promising journey, Voll Marintek will be conducting a FEED study in September 2022 for which they have been granted a significant grant by Innovate UK. The company will look at different potential well designs which would require P&A and test the technical, commercial and operational feasibility of the Lean Machine against them. Over the course of the study, further engineering and optimisation of the solution will be undertaken.

"We are already receiving interest from operators to manufacture the system and offer it at a rental rate. The idea here would be we manufacture the system, rent it out and then provide maintenance and support when needed," comments Vollmar.

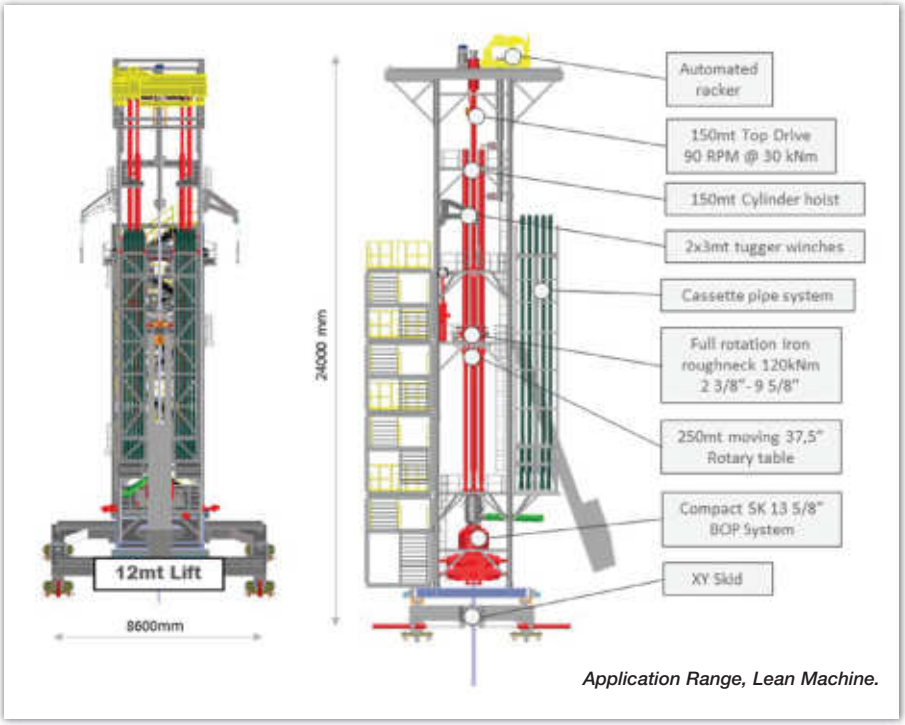
> "The Lean Machine is already attracting attention which is driving it steadily towards commercialisation."

While Europe is the launch pad, it is clear that Vollmar envisions the Lean Machine being rolled out across the globe.

"This solution has been developed through niche market research, and found many markets are not currently provided for with a sufficient solution. For example, Australia and Brunei have a lot of wells in four to five metres water depth which you cannot enter with normal jackups. So you need to engineer something which is light, compact and could be added to any vessel of opportunity. But, at the same time, you don't want to make any large vessel modification. So companies have been looking at lift barges to put a cantilever on, but this is not economical, or would only be so with a contract for 5-10 years as, again, you need to make modifications. It would be much easier to have something light and compact which could be put on top of the wellheads and even deployed by a jacking barge (or between two).

"In Asia and Africa, people did not really think about workovers, and so you often find wells with a production facility incredibly close. Workover equipment is only feasible if you look really deeply into interfaces and have the time and resources to do it. The Lean Machine could really help here, and can be easily adapted depending on how much space is available at location."

Image Credit : Voll Marintek



Application Range, Lean Machine.

After the start of the FEED study, the next steps for Voll Marintek will be building alliances, manufacturing and testing and field trials before commercialisation – currently targeted in 2024/25. Without doubt, there will be many in the industry following this progression with great interest. ■

Decarbonising natural gas processing

SOGAT 2022, which takes place from 5-8 September in Abu Dhabi, will provide a forum to discuss the latest sour gas processing and treatment technologies, with a focus on decarbonisation and emissions reduction.

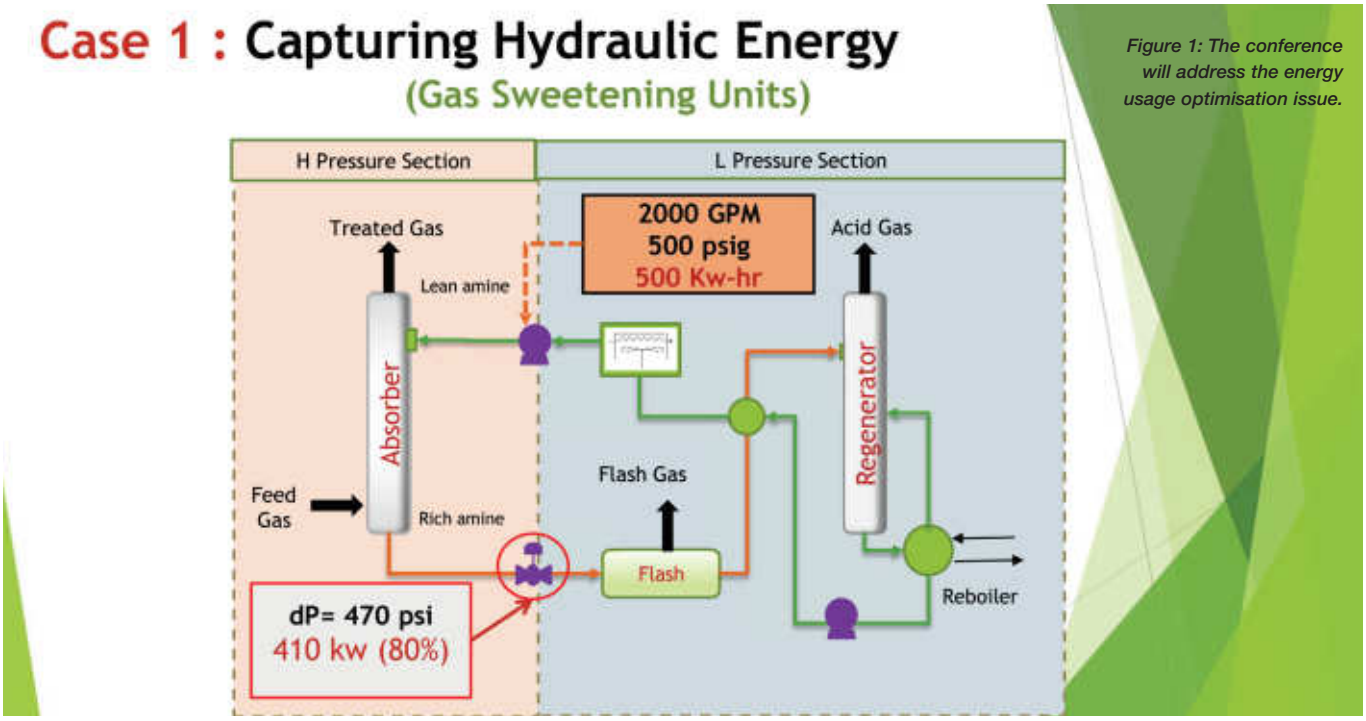


Figure 1: The conference will address the energy usage optimisation issue.

Image Credit: www.tecscope.online

AMID THE ACCELERATING worldwide trend towards decarbonisation, natural gas, which among fossil energy sources has a lower environmental impact, is expected to experience a significant future demand as a primary energy source. Natural gas is also one of the most suitable sources to be paired with carbon capture and storage (CCS), at a time when the cost of CCS is declining, as deployment increases and additional policy and financial incentives become available. Moreover, CCS is a critical technology to reduce emissions whilst maintaining energy supply and security.

This makes natural gas processing a key element in energy transition plans to unlock opportunities across the entire energy value chain. Moreover, natural gas processing in the Middle East, which will account for 37% of global gas processing capacity growth by 2025, involves the removal of impurities such as CO2 and H2S to comply with end user specifications and avoid corrosion. High-concentration CO2 streams resulting from the separation process makes gas processing one of the easiest and lowest cost applications of CCS.

It is also important to remember that optimisation of energy usage throughout the entire chain is critical towards achieving minimum carbon footprint, particularly as Sulphur Recovery Units (SRUs) are one of the higher energy usage parts of a gas processing plant. This step should be the focus of industry to control carbon management levels before embarking onto other sophisticated and more expensive decarbonisation options.

> “The debate will centre around the value that gas conditioning allied to CCS brings to the energy transition process.”

Thus, the debate at the SOGAT 2022 conference will centre around the value that gas conditioning allied to CCS brings to the energy transition process at a time when the region’s increasing natural gas demand, due to its growing population and industry growth, will necessitate the future development of several technically challenging sour gas resources, such as the UAE’s Ghasha project and Saudi Arabia’s Jafurah unconventional gas development. The conference programme will encompass the many technical solutions that address these challenges as well as the energy usage optimisation issue in particular. **(See Figure 1).**

Many case study experiences will be presented including a new process of combining membranes with liquefaction, providing a significant advantage in CO_2 removal from natural gas while recovering high purity dry CO_2 as a by-product. **(See Figure 2).** The advantages in adopting this approach against the conventional method of using an amine unit with a selective solvent for CO_2 removal, will be highlighted. Similarly, one of the several contributions from Saudi Aramco will feature a novel approach for simultaneous acid gas enrichment (AGE) and CO_2 capture. This new process combines membrane and amine technologies to achieve unprecedented levels of H_2S enrichment (>90%) and efficient CO_2 capture.

The substantial emissions of CO_2 from SRUs are coming under great scrutiny, and methods of reducing or eliminating CO_2 emissions are being studied. So the paper exploring the options for CO_2 removal from SRUs in gas processing plants using oxygen enriched technology to remove nitrogen from the system and simplify the CO_2 recovery will be of significant interest. Hydrogen recovery options will also be addressed in this paper, and it will illustrate the design options for application of oxygen enriched technology in the retrofit of an existing plant and in the design of a new-build SRU, of which there are many planned. Also on the question of emissions, the paper on tunable diode laser absorption spectroscopy analysers which have an exceptionally fast response to changes in H_2S concentration will be of great interest

As ever, there are many new benefits of sulphur recovery developments covered at SOGAT, and this year an additional example will be a paper describing a novel process for lean acid gas utilisation for sulphur production with higher efficiency.

The role of hydrogen

One of the many recurring features of the energy transition debate is the role that hydrogen will play, where demand for hydrogen is expected to increase by 10-fold by 2050. In fact, multiple industry reports predict up to 24% of the world's energy demand will be supplied by hydrogen. Hydrogen has a unique ability to address 'hard-to-decarbonise' sectors including refining, but to achieve this, the hydrogen must be produced with significantly lower carbon intensity than is practiced today.

Despite there being significant value for the recovered sulphur at today's prices, H_2S removal historically has been thought of as a waste gas disposal problem. As the world begins to embrace hydrogen as an energy vector, the time has come to take a fresh look at H_2S. This will certainly be the case at SOGAT 2022, with a presentation on a new chemical cycle process producing hydrogen from H_2S, with the process rapidly scaling from industrial piloting to commercial implementation. It has also been reported how plasma and microwaves can also be used to split the H_2S molecule. These technologies have been demonstrated at pilot scale, and more on this approach will be found at http://sogat.org/RandD-info.html. This is a new feature of the SOGAT website, and will be added to on a regular basis for visitors' benefit. Such technologies would simultaneously boost the value of sour assets and enable more facets of the hydrogen economy going forward. In the plasma and microwaves technologies case, the organisers are planning a virtual workshop later in 2022, where all international parties will come together to present their views for attendees' review and discussion. Interested parties should contact nick@domeexhibitions.com for more on this future event.

Image Credit: Rameshni & Assoc. Tech. & Eng., LLC

Figure 2: A new process for CO_2 removal for natural gas will be discussed.

> "The time has come to take a fresh look at H_2S."

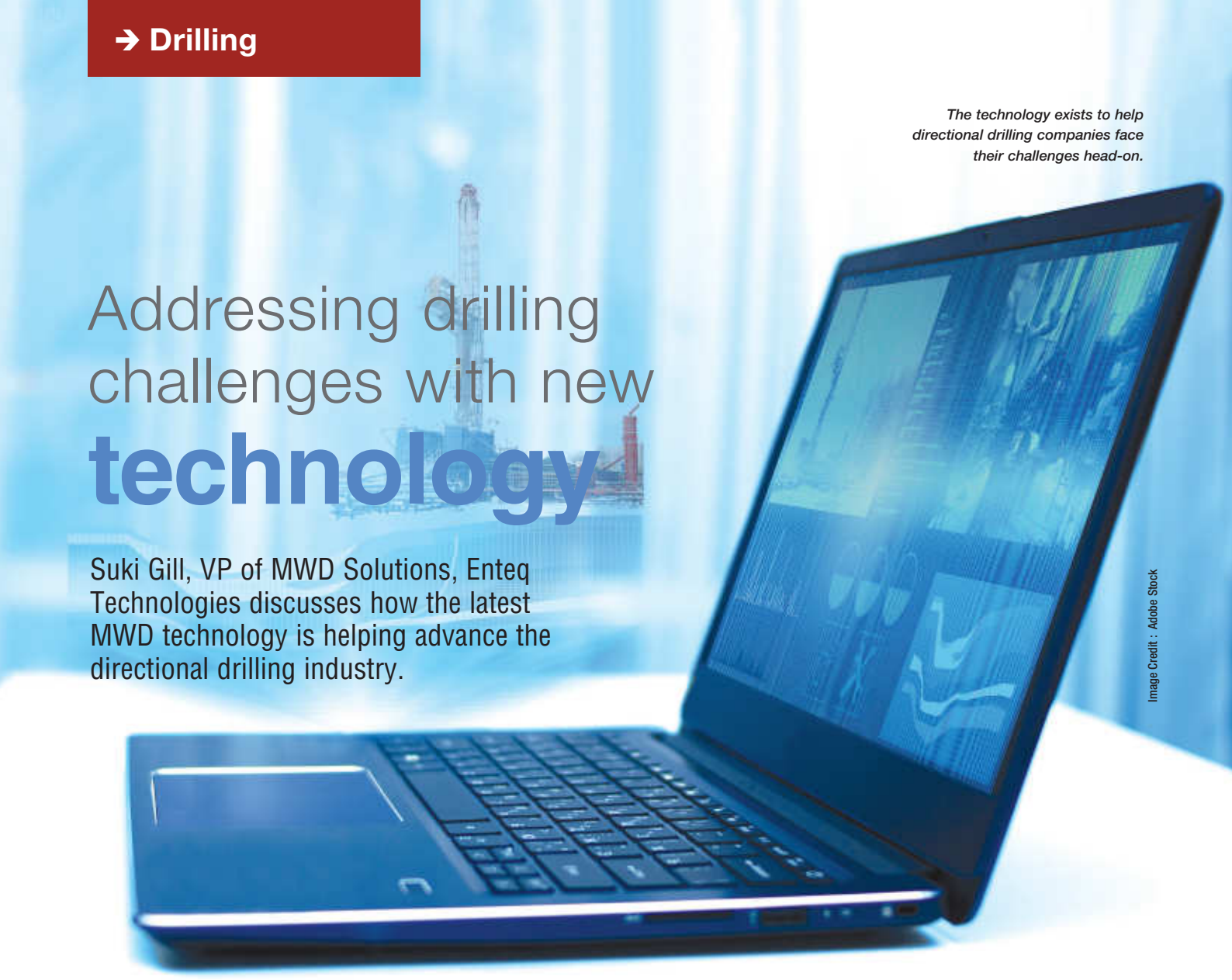
One of the many respected aspects of SOGAT is the debate of new and relevant technology applications and in addition to the above, the conference will include new HSE approaches where a presentation will be given on a cost-saving TÜV-certified software platform that digitalises the verification process throughout the safety lifecycle. The operational and maintenance data is automatically collected from disparate sources and real-time analytics employed to ensure that any initial HSE assumptions are valid. Moreover, in areas where the design was overly conservative, test intervals can be relaxed, safety functions downgraded, and valuable uptime freed up. Plus if it is discovered to have been under-engineered, then this can also be corrected. And, in either case, the owner has the data to demonstrate compliance with the relevant standards and laws, especially after modifications are made. Additionally, the use of such software can drive down insurance premiums as well as CAPEX and OPEX.

Another great example of the benefits of digitisation in sour hydrocarbon management will be the presentation that demonstrates the clear need for more transparency and a higher level of control over the practical procedural knowledge of the workforce, as well as illustrating how enhanced reality technology reduces human errors through increased operator competency in sour gas operations.

Materials management is also a vital part of responsible sour hydrocarbon development. For SOGAT 2022, presentations on mechanically lined pipe usage in sour service and the innumerable benefits it offers and how the importance of creep resistance in the hot face refractory SRU linings have been redesigned to reduce this increasing problem, will underline this important element.

Some of these new technology presentations will be enhanced by further demonstration in the associated exhibition, making SOGAT 2022 not only a unique opportunity to review the most recent advances in sour hydrocarbon management for attendees to employ in their own environments, but also a venue to re-engage in face-to-face business opportunities. ■

Full information on the event, including registration, will be found at www.sogat.org



The technology exists to help directional drilling companies face their challenges head-on.

Image Credit : Adobe Stock

Addressing drilling challenges with new technology

Suki Gill, VP of MWD Solutions, Enteq Technologies discusses how the latest MWD technology is helping advance the directional drilling industry.

WATCHING A RIG crew on a mission to save the world in Armageddon sparked my interest to become a petroleum engineer. In the 1998 Michael Bay spectacular, the crew are on a mission to drill a borehole and plant a bomb on an asteroid that threatens the planet. The plan succeeds, and the crew are global heroes.

Needless to say, the technology and drilling process depicted in the movie is not an accurate representation of drilling today. The economics of drilling have shifted; it is known the pandemic has hit the oil and gas sector particularly hard. It was always a tough job, but it has become a whole lot tougher.

Many of these trends are irreversible. But the oil and gas sector has always adapted, survived, and ultimately thrived in the face of change. If we can think smarter – and fairer – about the technology drilling companies (specifically directional drilling companies) rely on to do their job, the industry will flourish again. At Enteq Technologies, we are trying to lead by example through our approach to the measurement and logging-while drilling (MWD/LWD) market.

Different days for directional drilling – what has changed?

In 2014, drilling a well could take 24-27 days. Today a similar well could be drilled in just seven-ten days. That is beneficial for the operator, but not good news for the directional drilling company. Since directional drilling companies are paid a day rate, not a lump sum when the work is completed, drilling a well in less time decreases company revenue. The oil and gas market has always been cyclical and tracked the oil price, but a number of trends plus the pandemic have eroded the sector's economic stability over time. Today, the oil price stands at around US$100/bbl, but in 2021, it went negative for the first time in history and no one was predicting it to tip US$100/bbl anytime soon. Rig counts were slashed, as were day rates. That trickles down to hiring, putting pressure on companies to rely on fewer, cheaper (meaning less-qualified) people. Now the numbers look healthier again, but for how long?

> "Operators want to go deeper and faster."

At the same time, the jobs themselves have become more demanding. Operators want to go deeper and faster, and demand even small and mid-sized directional drilling companies to have the latest MWD/LWD tech, such as resistivity- at-bit solutions. There is also increasing demand for hot tools capable of operating in high-temperature environments. Though this is still a relatively small proportion of the total market, it may well increase further as sectors such as geothermal energy expand.

There is also a degree of geographic disparity to contend with. While North American directional drilling service providers

may have to pay top dollar for the latest at-bit solutions, they are at least available to them. That is not always the case for those drilling in, say, China. Often it takes years for that tech to become widely available to independent service companies in the rest of the world, and even then, still at premium rates – potentially with forex disadvantages versus the US dollar, too.

High time for high-tech

So, what can we do about it? We may not be able to do much about the underlying trends changing the economics of directional drilling, but we can offer technology to drilling companies to meet those challenges head-on.

For example, automation and IoT can be critical to assuaging cost and labour pressures. With day rates depressed, it can be painfully expensive to deploy fully qualified MWD engineers to every job. If COVID taught us anything though, it is how effective remote working can be nowadays. So, by automating the operation of MWD/LWD tools and adding remote telemetry, you can rationalise that highly-educated workforce in a central office (or a virtual one even, working from home) and from there they can look after a portfolio of five or six rigs rather than having to be deployed, on-site, to one. As a bonus, this also fits neatly with operators' drive reduce overall personnel footprint on rigs.

For example, leading technologies today have built in artificial intelligence (AI) to simplify decoding, meaning minimal input from the MWD tech on location. If and when there are decoding issues, that MWD tech can pick up a phone to a team of dozens of software engineers working around the clock to help them fix the problem. For the drilling company, it means a smarter, leaner operation with less need to deploy top-rate talent to every job and the ability to manage operations remotely, allowing them to take on more work and reassign dollars to capex to invest in getting top tech into the fleet.

An expanding range of data types also works to the benefit of drilling companies. Better downhole batteries enable real-time transmission of metrics such as collar RPM and BHA (bottom hole assembly) health. Real-time measurements then allow for drilling optimisation, pushing the equipment as hard as possible without exceeding risk thresholds – the sweet-spot, so to speak. These are enhanced further by advances in electromagnetic (EM) telemetry systems boosting the rate and reliability of data transmission versus older EM or mud-pulse systems.

Newer sensor types such as micro electrical mechanical system (MEMS) sensors are also pushing the envelope on MWD design. If traditional sensors are hard disk drives, these are solid state – a genuine leap forward in technology with greater resilience to shock and vibration, but at a higher price point. They enable real-time measurements such as stick-slip to further optimise drilling and get the most out of equipment, although it is important not to over-specify where cheaper legacy systems are fit for purpose.

Upgrading downhole measurement

The tech is there to help directional drilling companies face their challenges head-on, but it can be difficult to cost-effectively access the best equipment for the task at hand. That needs to change.

We probably can't expect another box-office blockbuster where drilling companies save the day anytime soon – too much has changed since 1998. Although hero-status is a bit much to ask, directional drilling service providers worldwide deserve our support. At Enteq Technologies, we can give that by providing access to the very best MWD and LWD tools on the market, integrated into bespoke solutions based on decades of real-world, downhole directional drilling expertise. ■

Drilling activity on the up

INCREASED DEMAND IS translating into higher levels of drilling activity, according to Westwood Global Energy Group's Global Land Rigs Q2 Newsletter, and this quarter has also seen a large amount of merger and acquisition (M&A) activity in the industry. This includes KCA Deutag's acquisition of Saipem Onshore Drilling, which will see KCA Deutag add 75 rigs across six regions to its fleet, the majority located in Latin America (37) and the Middle East (31).

Giving an overview of developments in the Middle East Westwood Energy reports that the Iraqi Drilling Company and Weatherford have begun drilling at Nasiriyah, a key project to increase Iraq's production capacity, although security, infrastructure and geopolitical challenges cold prevent production targets being reached. Saudi Aramco has continued to invest in unconventional plays as it looks to raise oil production to 13mn bpd with National Energy Services Reunited (NESR) awarded a US$300mn contract for fracturing, testing, wireline, coiled tubing, slickline services, associated logistics and site services. ADNOC Onshore awarded an EPC contract to Archirodon Construction Overseas Company in June to increase the production capacity of the Asab oilfield, which will involve the drilling of thousands of wells utilising ADNOC's onshore rig fleet.

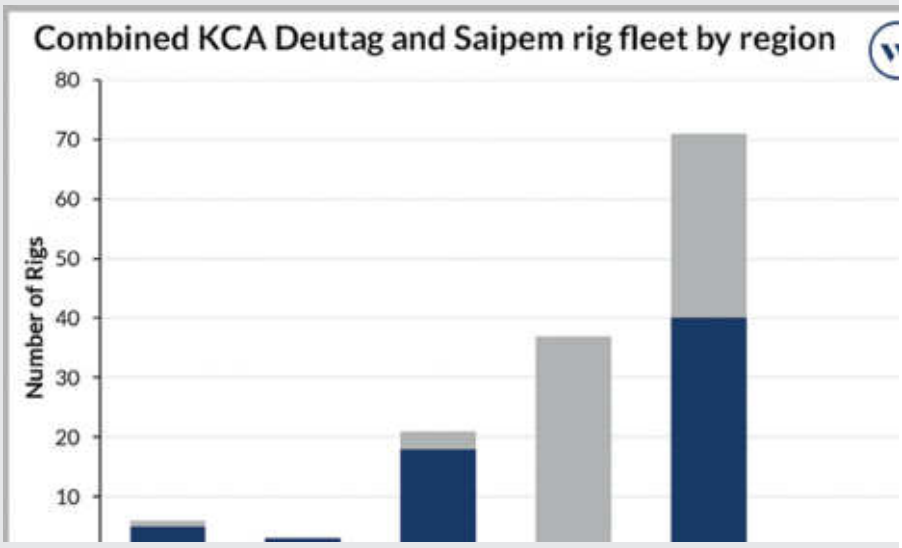


Image Credit : Westwood Global Energy Group

Combined KCA Deutag and Saipem fleet by region.

Activity also appears to be ramping up in Iran, which is aiming to increase production from 2.5mn bpd to 5.7mn bpd by 2030, which will require substantial growth in onshore drilling. In May, the National Iranian Oil Co. (NIOC) outlined plans to award contracts worth US$7.5bn, for the expansion of the Azadegan oilfield, Iran's largest oilfield. NIOC subsidiary PEDEC and Petropars, who are responsible for the field's development, began a 10-well drilling campaign in March 2022. While in Oman, BP Oman has signed a two-year extension for a land rig services contract with Abraj Energy that will see the local company continue to supply land rig services at BP's Block 61 developments.

Protecting pumps, production and **people**

Durgesh Jha, Middle East & Africa sales leader – reliability solutions at Emerson Automation Solutions discusses the benefits of continuous pump monitoring.

PUMPS ARE ESSENTIAL in the daily operations of industrial oil production processes. The challenge most operators face is that these pumps begin to degrade as soon as they are running, with a roster of potential risks that producers must keep an eye out for. Fluid loss is one of those risks which can effectively be reduced through dual seals, but for a compromised reservoir tank on an unmonitored pump, this can mean serious complications that can lead to the depletion of seal fluid levels from lack of lubrication and eventually, seal damage. Mechanical pump switches also have the tendency to stick, which can be detrimental to the entire unit. All these point to lack of monitoring on the pumps, which results in reduced productivity, operational shutdown, expensive repairs, and lack of compliance to regulations. In addition to fluid loss, it is also important to note the safety risk brought by dangerous fumes and threat of combustion within the facility.

Additionally, with the global shift towards sustainability, stringent laws and regulations are being built around greenhouse gas emissions reduction where it is becoming imperative for producers to reduce their fugitive emissions through the improvement of their overall operations from improving leak detection and repair, installing vibration and temperature sensors, to applying state-of-the-art seals, which can all be enabled with predictive maintenance.

Offshore platforms often operate in harsh conditions far from land, which calls for high reliability assets, especially pumps. These pumps are usually maintained and inspected manually with a technical crew flying to the locations at regular intervals. It is estimated that pumps account for 7% of the total maintenance costs of a refinery, and pump failures are responsible for 0.2% of lost production.

> “The challenge most operators face is that these pumps begin to degrade as soon as they are running.”

What if you had a cost effective, easy to apply solution for monitoring these pumps 24/7?

Pumps are, without question, significant players for maintaining production schedules. In process plants, as many as 90% of process pumps are monitored manually, or not monitored at all. Statistically, pumps will fail or suffer degraded operations every 12 months. This cycle provides a great opportunity for producers to deploy cutting edge technologies for pump monitoring that can predict failures and make it simple to take proactive measures in safety, regulations, and shutdowns.

Each operation is different, which is why it is highly important to carefully evaluate the factors at play in selecting and deploying solutions. These factors can be the current pump installation, maintenance and operational challenges faced by the team, current and future KPIs, budget, and return on investment.

Image Credit : Emerson

Small, easy-to-install sensors such as this vibration monitor can warn if an asset needs attention well before a turnaround.

A simple solution can start with an offline route-based condition monitoring, to an advanced solution involving online wireless or online continuous monitoring technology to collect key parameters like vibration, fluid leak, temperature, and feed to analysis software. The software will compare actual sensor readings to the pump’s predictive, ideal values. It then provides exception-based notifications of developing problems to operators, along with the pump’s diagnosis and prioritisation.

Wireless monitoring of key parameters of a pump using pervasive sensors has helped the industry make the leap from reactive to predictive maintenance. Emerson’s wireless vibration and temperature monitoring is one of the pioneering technologies that leveraged wireless solutions to improve data collection in pumps. It is now deployed across global major oil and gas end users due to its easy deployment in both onshore and offshore locations, enabling operators to start small scale with a low budget and minimal risks, realise quicker ROI and expand further at their own pace.

Now, digital solutions are becoming more accessible with the recent technological advancements in machine learning and analytics, which

can help address key pump issues. These include Emerson's Plantweb Optics Analytics Pump Template, a ready-to-use platform agnostic software component that allows users to monitor, manage, analyse and create visibility on the performance of pumps. Similarly, Emerson's PeakVue technology cuts through the complexity of pump analysis to provide a simple, reliable indication of equipment health through a single trend.

Edge Analytics lends another avenue for the industry to monitor their assets. Emerson's Edge Analytics device AMS Asset Monitor can be installed near to the pump to collect vibrations and other process parameters and deliver embedded prescriptive analytics to determine pump condition while broadcasting the results of the analysis in an easy-to-understand format. When connected to Plantweb Optics, users can receive updates in their office or on their mobile device with embedded prescriptive analytics that deliver easy-to-understand results for operators with limited to no prior knowledge and experience around pump maintenance.

> "These solutions enable operators to be proactive in the way they maintain their operations."

These solutions enable operators to be proactive in the way they maintain their operations, offering a wide range of opportunities to improve their KPIs, make relevant decisions based on analytics, learn more about their operations with predictive models, and scale up to enterprise-wide pump monitoring. By deploying such solutions and software, they can prevent the challenges in pump performance and condition and unplanned shutdowns, and start building towards better asset assessments, best practices, and expert knowledge sharing. ■

Image Credit: Emerson

The AMS Asset Monitor is an edge analytics device that delivers the benefits of continuous monitoring to more plant assets at far less installation expense.

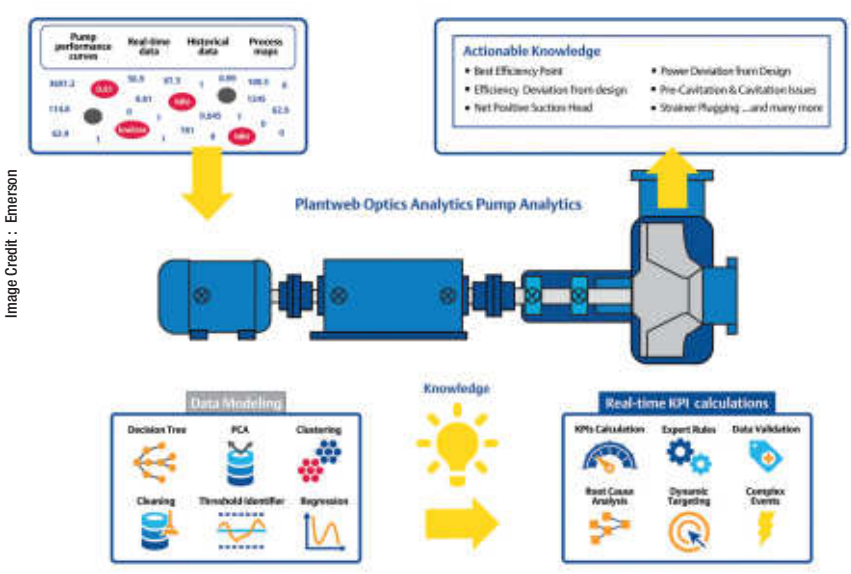


Image Credit: Emerson

Analytics Dashboard: Pump Template is a ready-to-use software component that allows users to monitor, manage, analyse, and create visibility on the performance of pumps.

Using captured CO_2 to optimise oil recovery

SULZER'S PUMPS ARE helping to optimise oil recovery while reducing greenhouse gas emissions in a pioneering project in the Middle East.

As part of enhanced oil recovery (EOR) techniques, captured CO_2 emissions that have been converted into supercritical CO_2 are pumped into depleted oil reservoirs to push the remaining oil to the riser, allowing much higher recovery rates. The pumped CO_2 is then stored in the underground oilfield, providing a perfect storage medium for the greenhouse gas. This circular process has the power to transform the oil and gas industry by reducing CO_2 emissions, while simultaneously maximising recovery from existing oilfields.

Sulzer's highly specialised pumps allow the CO_2 to be pumped like a liquid, sweeping through a reservoir to push the oil to the riser with much higher efficiency than traditional methods using water. At the same time, the depleted oilfields then provide a perfect storage medium for the CO_2, ensuring that it is not released into the atmosphere. Sulzer's expertise is critical to the process, as the lightness and extremely high pressure of CO_2 have a significant impact on the design of the pump, the company says.

Frederic Lalanne, CEO and president of Sulzer's Flow Equipment Division, commented, "As global demand for energy and materials continues to rise, it is becoming ever more important to optimise the use of existing resources and work towards increasing renewables while also expanding the circular economy. Sulzer is committed to accelerating this transition using its engineering expertise, and this innovative process is one more example of how our technology can help to sustainably transform CO_2-emitting industries."

Facilitating compliance with ESG targets

As net-zero becomes an unstoppable movement, industrial enterprises can leverage advanced technologies to unlock operational and sustainability benefits across every aspect of the energy value chain, explains Harpreet Gulati, senior vice president, Planning, Simulation & Optimization Business at AVEVA.

Image Credit : AVEVA

Harpreet Gulati, senior vice president, Planning, Simulation & Optimization Business at AVEVA.

AROUND THE WORLD, industrial enterprises of all kinds are racing against the clock to keep planetary warming to 1.5°C, and to support net-zero carbon emissions by 2050. Public and private sector companies alike have committed to supporting the energy transition – but now comes the difficult task of making good on those promises.

Businesses in mature industries such as oil and gas, mining and metals, and power generation and chemicals will need to address new business imperatives if they are to build an alternative, sustainable energy landscape while maintaining current operations continuity.

The playing field has changed, and businesses must adapt to ensure they survive – and thrive. Regulatory alignment has begun to coalesce around stricter Environmental, Social, and Governance (ESG) regulations. Alongside, more than 80% of companies worldwide now report on sustainability, a figure that rises to 90% for the largest corporations, KPMG reports.

If they are to maintain their social licence to operate, companies must also comply with ESG pressures from their communities and from consumers who are looking for more sustainable solutions. Consumers are now embracing a more sustainable lifestyle, whether in terms of consumer goods or clean energy alternatives, and are questioning brands about their environmental credentials, increasingly making spending decisions in line with their convictions.

On the supply side, businesses must reconcile these imperatives with volatile prices, increasing labour shortages and continued supply chain disruptions as the pandemic continues to rewrite the operational playing field.

With energy sector businesses forced to operate within these new constraints, digital technologies will be indispensable in supporting the transition to greener value chains at both the upstream and downstream ends. McKinsey estimates that up to 80% of the technologies needed to reach net zero are already deployed, some 15% are in prototype trial, and a further 5% are in the R&D process.

From AI-infused analytics to data-led platforms that enable industries to unify information streams for responsible decision making, the smart solutions that empower companies and help them identify ways to minimise environmental impact and costs are already available today.

Businesses can harness digital tools to facilitate ESG imperatives in three ways:

1. Achieve faster design and construction of carbon-efficient plants: Energy companies transitioning to cleaner businesses, such as the ones related to wind, solar and biofuel, require new greenfield assets or may need to modernise existing installations. A data-centric approach, combined with the latest technology can drive faster and more effective engineering cycles across the project's life with an eye on the sustainability footprint. Integrating artificial intelligence-infused simulation with the engineering database can rapidly enable speed and deliver the breath of insights needed to build the most carbon- and energy-efficient plants at the very first attempt. There is no room for error given the short window of time available to achieve our net-zero ambitions, as well as the increased transparency around ESG reporting.

2. Reduce waste and improve efficiency with digitalised supply chain management: As the pandemic has shown, market conditions can change overnight. By simplifying and standardising downstream supply chain management, businesses can quickly adapt to market changes and capitalise on emerging economic opportunities. Migrating to a unified enterprise platform with built-in data management and embedded business process workflows builds digital resilience while plugging value leaks, reducing waste, sustaining productivity and supporting quicker decision-making in service of a circular economy.

3. Foster hybrid and remote-working solutions for more efficient operations: Digital transformation serves as a proven buffer against continuing uncertainty that impacts workforce productivity. When companies leverage AI and the cloud for edge-to-enterprise visualisation and intelligent data management, staff gain clear and contextual access to data, wherever they are. Not only can they execute operational processes remotely, but they can also collaborate with colleagues and business partners anywhere around the world, thanks to virtual environments that replicate real-time operations connected to a reliable operational data management source. Greenhouse gas emissions can also be reduced along the way, through reduced travel and minimal use of materials such as plastic and paper.

Technological innovation can serve as one of the primary building blocks to realising a net-zero pathway when deployed alongside other solutions as part of a multi-layered approach, including lower-carbon energy sources and ramping up efforts to improve carbon capture, utilisation and storage.

As a recent AVEVA survey shows, the energy industry is committed to driving to net zero and tackling climate change. Nine out of 10 businesses see sustainability as a key focus area for their companies over the next three years. In fact, 89% of C-suite leaders are committed to helping tackle climate change.

As momentum builds around the energy transition, companies that act now to integrate technology in service of ESG goals will drive long-term value through to 2050 and beyond. ■

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His Excellency
Suhail Mohamed Faraj Al Mazrouei
Minister of Energy and Infrastructure
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The key to unlocking the power of data

Unlocking the power of data will be key to ensuring companies can maintain business continuity, drive operational resilience and benefit from emerging technologies, says Geir Engdahl, co-founder and chief technology officer, Cognite.

INSIDE NEARLY ANY type of business is a treasure trove of data. It is the companies that understand how to maximise the value of that data and use it to improve decision making, accelerate innovation, enhance the customer experience and drive operational efficiency that will have the competitive advantage. However, it is easier said than done, and companies may find extracting this data value to be challenging.

Siloed data, outdated tools and shadow IT are the most common hurdles faced by industrial businesses. These are the barriers that companies need to overcome if they aim to democratise data and analytics, streamline collaboration and accelerate time-to-insight. The global skills shortage represents another barrier, and it is clearly one that must be addressed if companies are to have access to the right talent pool to tap into that data. According to a DNV study, 91% of energy companies say digital skills training is needed in the oil and gas industry.

The energy industry is also facing an ageing workforce, with 43% of workers over age 50, according to the UK's Department for Business & Energy Strategy. That makes the optimisation and contextualisation of data essential to ensure maintenance and operations teams have access to insights that might otherwise be lost as a critical part of the workforce enters retirement. This is yet another reason why driving business continuity and operational resilience through the power of industrial data is crucial.

Tackling proprietary data protocols

When looking at process-heavy industries, focusing on core operational technologies is key. Systems from multiple vendors, each paired with proprietary protocols, can lock down data, and these systems have an average lifespan of around 20 years. The impact of this mix of legacy kit, disparate control systems, non-compatible data models and communication interfaces can limit a company's ability to collect and contextualise its data.

Cognite experienced this challenge first hand when it supported an oil and gas company that had 30 oil platforms with more than 300 wells. The operator lacked a unified overview of maintenance activities within and between all assets – ultimately a costly and ineffective way of working. As the data team coming in to fix this challenge, the Cognite focus was on ensuring that this business did not have too many disparate control systems using proprietary data models and communication. By bringing these systems together into a shared platform, this oil and gas operator could consequently optimise scheduling, improve communication across organisational silos and make data-driven decisions.

Concentrating on user needs

The secret recipe for many successful companies is to maintain a laser focus on their users and on improving their operational efficiency, along with their ability to make rapid and higher confidence decisions. Data plays a role here, and the work to structure an organisation's data can bring value to multiple users. The key is understanding how people interact with data across the operation and be aware of how the data needs to be presented to the various roles in the company. By maintaining a user-centric focus and having a solid foundation of scalable data, companies can accelerate time to value.

Across industrial operations there is also a major focus on data analytics to support optimised decision making and to enhance operational efficiencies. In the future, this could lead to the adoption of AI and machine learning to intercede in the operation of industrial facilities in complex use cases, such as where Distributed Energy Resources (localised energy generation) is deployed.

Environmental impact is also something increasingly important for users. One example of this is from another Cognite customer, Aker BP. This oil and gas company used machine learning smart monitoring systems to visualise all data relevant for troubleshooting water contamination and identify factors related to high oil-in-water concentrations. This helped the company decrease its time spent on mitigating actions, a savings equivalent to an annual revenue potential of US$6mn. So, concentrating on user needs not only helps to unlock the power of data, but also to drive operational resilience.

Using trusted data sources

Industrial data empowers everyone who engages with it, but the analytics and applications that leverage this data will come from the end users, software providers and equipment manufacturers. When you have a trusted data source with common assets, you have a very strong basis for using low code to develop in-house applications as well as AI to enhance decision accuracy. Given the current industrial landscape, as well as greater market requirements, such as data-intensive carbon reporting and business model disruption from digital technology adoption, companies that do not focus on data as a key asset will face a significant competitive disadvantage.

Fortunately, most companies realise that if they were starting operations today, given the tech we currently have available, their processes and teams would look very different relative to today's teams and processes built around legacy technology. The businesses that can adjust their people and processes will have a first-mover advantage in this new data-driven era. Those that remain wedded to past investments will eventually have to shoulder twice the technology debt.

At this point in the industrial space, there is a lot of focus on analysis to support optimised decision making and making operations more efficient. In the future, there may be adoption of AI and machine learning to operate industrial facilities for more complex use cases such as smart city concepts. Unlocking the power of data will be key to ensuring companies can maintain business continuity, drive operational resilience and grab all the benefits they can from emerging technologies. ■

The autonomous and digital future of the offshore sector

Hannes Swiegers, director IRM Services & Remote Operations, Fugro, Middle East & India discusses the rise in autonomous operations in the maritime and offshore sector, and Fugro's activities in this space.

Fugro's Blue Prism next generation USV will combine an ultra-low carbon footprint with high quality data collection, weather resilience and endurance characteristics.

Image Credit : Fugro

How are cutting-edge technologies such as Artificial Intelligence (AI), Cloud Computing, Internet of Things (IoT) etc. influencing the maritime industry?

The Industrial 4.0 revolution can be seen as a mega trend for the maritime industry that defines a global, macro force that will transform business, the marketplace we operate in, and society. There has been a significant increase in cutting-edge technologies in the maritime industry, with digitalisation streamlining existing processes, creating new business opportunities, and transforming supply chains as well as trade geography. These changes are shaping the industry in every aspect. Technology impacts development speed, sustainability monitoring, real-time measurement and active management of marine infrastructure. This digitisation accelerates asset life cycle extension based upon a sustainable approach.

> "There is a significant rise in the use of robotic technologies."

Furthermore, it creates interconnected synergies between sensors, vehicles or vessels and the observed environment. In our case, uncrewed surface vessels (USV) allow us to sail to the future comfortably. Today's deployed USVs are becoming intelligent systems controlled centrally, allowing real-time connections for essential geo-data to shore-based remote operations centres (ROC). USVs now hold complex sensing equipment and geo-data generators, producing and transmitting information in real-time, allowing for accelerated decision making, not to mention the situational awareness it creates for remote operations. Using this modern technology under the umbrella of Industry 4.0 accelerates remote de-risking decision making surrounding critical site or asset information. Data accessibility enabled through satellite connectivity permits massive geo-data transfer at a cost level that allows for automation of processes and functions, leading to a positive impact on operational safety, resource utilisation and expertise 'deployment' via a ROC.

As the world's leading geo-data specialist, we develop technological innovations in technology into integrated digital solutions – including visualisation, robotics, connectivity, and advanced analytics – to provide sustainable, safer, faster, more efficient, and better-quality services to our clients. Thanks to our remote and autonomous solutions capabilities, we send fewer people offshore, as we can process and analyse the geo-data from our onshore ROC.

Could you throw light on the progress of autonomous vessels in the maritime industry and Fugro's contribution towards the industry's remote ambition?

Autonomy is driving a change across a broad

spectrum of navigation and operations for the future of the shipping and maritime industry, due to novelty and promising commercial benefits. And as I said, there is a significant rise in the use of robotic technologies, such as the upgrade of sensor technology that allows faster and higher-quality data acquisition. This enables remote operations of USVs, which plays an essential role in the future of the maritime survey sector by improving safety, reducing carbon emissions and delivering high-quality data more efficiently. These USVs are operated in two modes, Line of Sight (LoS) and/or Over the Horizon (OtH), with intelligent systems capable of making decisions, allowing them to perform tasks without limited human intervention.

Fugro has already been using its 12 m Blue Essence USVs for specific offshore asset inspection operations in Asia-Pacific and Europe, with the Middle East stepping into the autonomous arena in Q3 2022. While remote and autonomous technology will revolutionise the way we conduct business, the continued success of Fugro rests on the skills of our personnel. In summary, to truly contribute to the industry's remote ambition, one needs to address the strategy, the technology and the resources. By investing in our people and ensuring that long-established industry standards are upheld, Fugro can confidently assure clients and regulators that our high safety and operational standards will remain firm as we develop and deploy our USV fleet to support the maritime industry whilst creating a safe and sustainable world.

How well are the digital infrastructures and technology evangelists equipped with cybersecurity within the maritime industry?

Cybersecurity is one of the key challenges as we move toward the digitalisation of the maritime industry. Remote and autonomous operations are not entirely possible without connectivity. Safeguarding connectivity means cybersecurity should stand central when it comes to enabling information technology (IT) and operational technology (OT). Countering cyber threats is imperative for every USV operating company, as failure to protect data is much greater now than it was in the past. Gone are the days when companies used to worry only about pirates, who hijacked sea-going vessels to steal the cargo or hold the crew hostage and demand ransom. Piracy has gone high-tech, resulting in enhanced

> “Remote and autonomous subsea inspection capabilities will change how we work.”

Hannes Swiegers, director IRM Services & Remote Operations, Fugro Middle East & India.

cyber-attacks on vessels operating IT and OT infrastructure. There are instances where substantial shipping companies have seen high-profit phishing attacks. So, it is crucial that uncrewed surface vessels (USV) or marine autonomous surface ship (MASS) operating companies ensure their software is robust to withstand cyber attacks, as USVs / MASS rely on technology in a variety of senses. The need of the hour is to increase awareness of cybersecurity, take necessary actions to close the security gaps, and increase active intrusion monitoring from outside in and inside out.

What does the future hold for offshore energy fields and subsea inspections?

In the modern world, data or, for Fugro, geo-data, is the key differentiator that will foster scalable and intelligent remote-operating models to drive sustainable growth based on safety, accuracy, and security. By embracing technology, offshore energy fields are already taking giant leaps into the future. Digital twins of an operating field are an excellent example of a technology (digitalisation) accelerator that extends the value of subsea inspections across multiple value chains. The live overview of all assets will ensure optimal operational efficiency while identifying deficiencies long before they become a real issue. This is combined with field-resident robotic sensors or USVs that change schedule-based inspection to risk-based inspection routines, allowing multidisciplinary experts in onshore hubs to monitor the situation offshore and make well-informed decisions when required. This is key to improve efficiency, reduce downtime, make the decision-making process instantaneous and enhance yearly planning for assets.

Remote and autonomous subsea inspection capabilities will change how we work, thinking of the future and implementing change today by managing assets, systems and data from anywhere globally.

Could you tell us a bit about Fugro's business and technology prospects in the Middle East region?

Our technology prospects align with our 'triple A' approach of acquiring geo-data, providing analysis and actionable advice. We aim to support our clients in managing their project risks during the construction and operation of their assets, both on land and at sea. We want our innovation to be led by digitalisation, deploying differentiating technologies for client solutions and applications based on robotics, remote operations, analytics, and cloud automation. Our strategy is to offer integrated client solutions across their assets' life cycle. So, what is a solution? We define it as a bespoke integration of multiple services and expertise, technologies, and products to create a differentiating offer to meet the needs of our clients and deliver value.

Now, to be more specific, for the current positioning and construction marine market sector, we will focus on deploying our vision technologies covering a range of value-add efficiencies for surface and subsea operations. The core of the vision technologies is a sensor-driven digital approach to enhance the quality, speed and affective measuring and/or monitoring of assets in challenging environments. Last but not least, our remote inspection solution is a new way of working that is based on a continuous inspection by light, uncrewed surface vessels in an end-to-end digital environment. It's a fully optimised solution for inspection tasks with real-time data transfer to a team onshore. Staff can analyse and interpret acquired geo-data in near real-time without mobilising offshore and spending time on complex logistical operations. This allows for faster data processing and data delivery, leading to faster and more efficient decision-making. It provides defined outcomes based upon greater quality data to analyse, driving more insightful advice to our client for decision making.

There is so much more to talk about, but before we do so, we need to listen to our clients and partners. Before connecting our differentiating solution with your experts, we need to understand your challenges and ambitions. If you want to know more or discuss any ideas, please get in touch with Fugro today to solve tomorrow's challenges. ■

Shifting to Sustainability

The oil and gas sector in many countries across the Middle East is looking to embrace alternative energy resources to combat the climate crisis. Madhurima Sengupta reports.

Image Credit : Adobe Stock

Industries across several Middle East countries are increasingly shifting towards renewable resources.

AS A REGION infamous for its heavy reliance on fossil fuels, certain countries in the Middle East such as Saudi Arabia, United Arab Emirates and Oman are giving serious competition to their international counterparts when it comes to setting climate goals. As a signatory to the Paris Agreement which came into being in 2016, Saudi Arabia aims to reduce up to 130mn tonnes of carbon dioxide emissions by 2030. Over the years, the kingdom has managed to cut down emissions by 26mn tonnes.

In line with the kingdom's climate pledges in the international arena, the state petroleum and natural gas company Aramco aims to reduce its upstream carbon intensity by 15% to 8.7kg of CO_2 equivalent per barrel of oil equivalent by 2035. And by 2050, its target is to achieve net-zero Scope 1 and Scope 2 greenhouse gas (GHG) emissions across its wholly owned operated assets.

The company, for instance, has resorted to using advanced plastics, which though created from carbon molecules, can serve as a lower-carbon substitute to traditional materials like steel and glass. Some of its other innovative sustainable approaches include vigilant tracking of the hydrocarbon content discharged to water (HC2W) KPI. The KPI measures the total amount of hydrocarbons released to the surface water through the company's industrial wastewater discharges and excludes hydrocarbon releases from accidental oil spill, which are tracked separately.

> "A recent report by Aramco outlines its focus on developing its blue ammonia and hydrogen business."

A sustainability report released recently by the company outlines its focus on developing its blue ammonia and hydrogen business as well. For example, it has entered into a partnership with the Hydrogen and Innovation Development Centre that has been developed by NEOM's ENOWA, and will support the new facility in producing and adopting decarbonised and clean synthetic fuels.

The Abu Dhabi National Oil Company (ADNOC) in UAE has taken similar strides in the sector too. "We have ambitious growth plans for clean hydrogen, a critical tool in efforts to decarbonise hard-to-abate sectors, which we are actively delivering on to meet demand in Asia, and…Europe as well," said Dr. Sultan Ahmed Al Jaber, UAE minister of industry and advanced technology and ADNOC managing director and group chief executive officer, as the company closed a deal with Germany in March last year to deepen collaboration on hydrogen. Another important initiative is a tie-up between ADNOC, bp and Masdar to progress the development of clean hydrogen hubs both in the UAE and the UK.

The UAE became the first Middle East and North Africa nation to declare the objective of reaching net zero by 2050. An exemplary energy producer and major driver of the economy in the country's capital, ADNOC adheres to a clear set of goals that have been categorised under two groups – one being climate, emissions and energy, and the other, local environment.

The company, which claims to bring down greenhouse gas emissions intensity by 25% by 2030, will be tackling it through the expansion of the capacity of their carbon capture, utilisation and storage (CCUS)

programme. It currently captures 800,000 tonnes of CO_2 annually to reach five mn tonnes by the anticipated year.

In tune with the Sultanate of Oman's second nationally determined contribution (NDC) report that was submitted by the country to the Paris Agreement on July last year, Petroleum Development Oman (PDO), the nation's leading exploration and production company, adds to the list of laudable measures being taken by countries in the Middle East to embrace renewable alternatives.

According to Abdullah al Abri, head of energy renewal, the renewable energy unit of PDO, investments in clean fuel could create between 34,000 and 147,000 jobs.

PDO have started a flurry of initiatives using solar energy as well. Miraah, the solar steam generation system, will capture and concentrate sunlight to generate around 6,000 tonnes of solar steam each day, which will feed directly into their existing thermal enhanced oil recovery (EOR) operations. They have installed enough solar photovoltaic (PV) panels into their car parks at Mina Al Fahal to supplement the power used in their headquarters at Muscat. Commissioned in January 2019, the 100-MW Amin Solar Park, which supplies electricity for PDO operations, took less than a year to materialise into the first utility-scale PV power plant in Oman in 2020. The company uses PV in well surveillance and seismic monitoring too.

> "Investments in clean fuel could create between 34,000 and 147,000 jobs."

Oman is keen on building a national hydrogen economy.

Image Credit : Adobe Stock

PDO is also a founding member of the National Hydrogen Alliance, which was formed in August last year. With 13 significant public and private organisations across diverse sectors coming together, the alliance is known to promote clean hydrogen in various capacities.

Keen on building a national hydrogen economy with a renewable energy capacity of 30 GW, the sultanate has sketched out investments in the area to the tune of US$34bn. It aims to expand its green energy capacity to 1 GW by 2025 and reach 10 GW by the end of the decade. A key player in this ambitious project is the state-owned oil and gas company OQ. The company has collaborated with the Korean Gas Technology Corp to tap the potential of green hydrogen and produce up to 1,000 tonnes of green ammonia per day in the Salalah Free Zone in the south of Oman.

Promising as the measures sound in paper, it remains to be seen if they are also implemented with as much zeal. Only then can the world reap the fruits of sustainability. ■

Energy and natural resources companies accelerate progress towards net zero

HALF OF OIL and gas executives expect their core business to decline in the next 10 years, and 72% believe they will have a new growth business that will complement or replace their core by 2030, according to Bain & Company's second annual *Global Energy and Natural Resources* report. The consultancy surveyed more than 1,000 global energy and natural resources executives to understand how the energy and resources transition is playing out in real time, which technologies and opportunities they are prioritising, and the pain points involved in squaring the traditional demands of their business with new demands to operate more sustainably.

According to the report, executives overwhelmingly see decarbonisation as a top priority, and they have higher expectations than they did two years ago. 88% say reducing Scope 1 and 2 emissions is a key priority for their company, 47% expect their company to change significantly in the next 10 years – up from 36% in 2020, and 96% expect the industry to make progress toward net zero by 2030. Executives expect to reduce emissions by 28% by 2030 and 61% expect to decarbonise on a faster track than the world as a whole.

Talent, culture and policy are the biggest impediments to success. A third of companies in mining and oil and gas say they are struggling to attract and retain talent for their core business, and across sectors, executives cite a resistance of incumbent culture to change.

For many companies in the energy and natural resources sector, the path to success depends on investing in new growth, and often low-carbon, ventures, such as renewable power generation, carbon capture and storage, green or blue hydrogen, circularity and new forms of electric mobility. The executives Bain surveyed say they are investing 23% of their capital into new business ventures, up from 16% in 2020.

Companies whose core businesses are most affected by the energy and resource transition are investing most aggressively, and these investments are blurring business boundaries.

Bain's research shows that the average company in utilities or oil and gas is currently pursuing at least four new growth areas. Oil and gas companies are focusing mostly on renewables, carbon capture, hydrogen and low-carbon fuels.

"We have seen a marked shift in what the energy and resources transition means to executives over the past year," said Peter Parry, chairman of Bain & Company's global Energy & Natural Resources practice. "Energy and natural resources industries are moving from ambition to action. While close to a quarter of capital expenditure in 2021 was directed toward change, we can expect this to grow toward 50% by 2025, establishing a transition path with greater clarity. This study highlights the positive trajectories for investment, technology and new business growth, as well as the urgent need for attention on how to deliver on the transition."

"The findings of this year's report make us cautiously optimistic. ENR companies are investing as much in innovation and impact, combined, as they are in economics – a good sign that executives are investing in the future," said Raja Atoui, partner and a leader of Bain & Company's Energy and Natural Resources practice in the Middle East. "The large profits that some energy companies earned during the first months of 2022 are likely to sharpen focus on capital decisions, as executives work to get the balance right between funding the current business, while also investing in future engines of growth."

ABB awarded for subsea technology

ABB HAS RECEIVED Frost & Sullivan's 2022 Best Practices Award for Global Oil and Gas Automation Technology Innovation Leadership, for leading the way in subsea automation with its underwater control systems and electrification services.

ABB was commended for the development and commercialisation of its subsea power conversion and distribution system. This gives oil and gas companies access to a reliable subsea energy supply of up to 100 megawatts of power over distances up to 600 km into the sea and 3,000 m of water depth with little maintenance required, despite operating at intense pressures and in extreme conditions.

María Agustina de Sarriera, Frost & Sullivan oil and gas analyst, said, "ABB's visionary and highly innovative solutions are technology advanced within the industry. The company achieved transformational growth in the automation segment via its subsea technologies. It invested in research, design, and development over many years in collaboration with Chevron, Equinor and Total Energies to develop this innovative power technology subsea system – investing around US$100mn over the years."

Brandon Spencer, president of ABB Energy Industries, commented, "The convergence of automation and electrification is key to reducing carbon emissions in the oil and gas sector. By powering pumps and compressors on the seabed, close to the reservoir, our technology can significantly reduce energy consumption as well as decrease carbon emissions by using power from shore. It has taken years and the dedication of around 200 scientists and engineers from ABB and our partners to make this a reality, and it is fantastic that Frost & Sullivan has recognised our collective achievement and leading technology through this award."

Frost & Sullivan also congratulated ABB on securing the US$120mn project with Chevron Australia and Aker Solutions to engage in power provision from shore and subsea out to the Jansz-Io field.

The company's approach to optimising operational efficiency was also commended, with special mention made of its capital projects and execution methodology – Adaptive Execution. With digitalisation and collaboration at its core, Adaptive Execution was developed to drive greenfield project efficiency. It can deliver CAPEX savings between 15 and 40%, reduce start-up work hours by up to 40% and compress schedules by up to 40%.

Halliburton introduces new drill bits platform

Image source: Halliburton

HALLIBURTON HAS INTRODUCED the new Hedron platform of fixed cutter polycrystalline diamond compact (PDC) drill bits. These drill bits combine the latest technology with an industry-leading customisation process to deliver high-performance, application-specific designs for customers.

The culmination of multiple technologies, Hedron drill bits are designed using Halliburton's Design at the Customer Interface (DatCISM) process, along with proprietary iBitS modeling and simulation software that enables the design teams to tailor each bit to unique customer challenges.

Hedron drill bits are the first PDC bits that incorporate Juggernaut cutters, Cerebro in-bit sensing insights, and Oculus advanced dull grading analytics. These technological advancements increase drilling performance through higher rates of penetration and extended run lengths.

"Hedron drill bits are the next generation of fixed cutter bits; we've designed them to drill farther and faster than any previous bit generation," said David Loveless, vice president of Halliburton Drill Bits and Services. "The combination of these transformative digital and hardware technologies enables Hedron drill bits to address today's most difficult drilling challenges and push the performance envelope."

AVEVA brings AI to refinery scheduling

AVEVA HAS INTRODUCED the AVEVA Unified Supply Chain, Schedule AI Assistant, an optimisation and AI-infused cloud-based solution designed to enable operational schedulers at refineries and petrochemicals plants to explore and rank various scenarios for efficiency, profitability, and emissions.

Across the entire supply chain, analytics automatically produce and assess multiple schedules and anticipated events, offering planners a range of choices for optimised schedules. AVEVA's Schedule AI Assistant then recommends a scheduling strategy that best meets the organisation's safety, sustainability and value chain optimisation objectives.

"Schedulers' strategic capabilities will be transformed by the latest offering as they will be supported by an AI-powered system that recommends the most practical course of action, saving time and enhancing productivity by allowing schedulers to focus on value-added tasks and encouraging them to exceed objectives. This can be a huge enabler of enterprise agility, allowing operations to respond faster to market changes or disruptions in the supply chain," said Harpreet Gulati, senior vice president, Planning, Simulation and Optimization Business, AVEVA.

Oxford Flow upgrades gas pressure regulator


Image credit: Oxford Flow

The Oxford Flow IM-S regulator.

OXFORD FLOW HAS launched the latest version of its gas pressure regulator, the IM-S valve, offering best-in-class resiliency, ongoing security of gas supply and seamless future-proofing for operators in the gas distribution, power generation, industrial gas and oil and gas sectors,

Oxford Flow has integrated customer feedback to create a superior model which is more compact and can be retrofitted seamlessly into gas distribution networks globally. The new IM-S regulator offers an increased flow capacity of up to 30%, and is designed for up to 100% hydrogen blending within gas networks. Furthermore, Oxford Flow has eliminated the diaphragm, the most common failure and wear point in conventional gas regulators, contributing to a minimum service interval maintenance interval of up to 10 years. The IM-S is built to be smaller and lighter, making the process of retrofitting into networks seamless, with no impact on existing systems and simple future maintenance.

Faris Churcher, principal applications engineer at Oxford Flow, said, "The IM-S is the next generation gas pressure regulator that enhances the benefits of the IM valve predecessor. Engineered with industrial recommendations and feedback at the forefront of its adaptation, this latest development improves maintenance and versatility, while ensuring resiliency against future grid challenges."

Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS, EGYPT

Project Name	City	Facility	Budget (US$)	Status
MIDOR - Midor Refinery Expansion	Alexandria	Refining	2,300,000,000	Commissioning
EHC - Ain Sokhna Ammonium Nitrate Complex Expansion	Ain Soukhna	Ammonium Nitrate	600,000,000	Engineering & Procurement
Assiut Oil Refining (ASORC) - Assiut Atmospheric Distillation Unit	Asyut	Crude Oil Distillation Unit	3,820,000,000	Engineering & Procurement
WAPHCO - El-Wady Complex for Fertilizers	Abu Tartor	Phosphoric Acid, Ammonium, Phosphate	1,200,000,000	Engineering & Procurement
RSNRPC - Ain Sokhna Petrochemical Complex	Ain Soukhna	Polyethylene, Polyester	7,500,000,000	FEED
ANOPC - Hydrocracking Diesel Complex - Overview	Asyut	Hydrocracker	4,000,000,000	Construction
ANOPC- Hydrocracking Diesel Complex - Hydrocracker Complex	Asyut	Hydrocracker	2,800,000,000	Construction
Petro Shorouk - Zohr Gas Field Development	Mediterranean Sea	Offshore Gas Field	12,000,000,000	Construction
RSNRPC - Polypropylene (PP) Plant	Suez Canal Economic Zone (SCZone)	Polypropylene	1,700,000,000	Feasibility Study
Energean - North El Amriya-North Idku Development - Subsea Tie-Back	Idku	Gas Field	235,000,000	Engineering & Procurement
PhPC - Atoll Gas Field	Damietta	Offshore Gas Field	300,000,000	Construction
GASCO - Western Desert Gas Complex - Train D	Western Desert	Gas Field	100,000,000	Construction
SOPC - Suez Refinery Expansion	Suez	Refinery	1,400,000,000	Construction
EGAS - GASCO - Dahshour Gas Compression Expansion	Dahshur	Gas Compression	200,000,000	Construction
Kuwait Energy Egypt - Abu Sennan Concession - Infill Project	Western Desert	Drilling & Production	100,000,000	Construction
AGIBA - South West Meleiha Development Lease	Western Desert	Drilling & Production	269,000,000	Construction
Misr Methanol and Petrochemicals Company - Methanol Plant	Ain Soukhna	Methanol, Ammonia	2,600,000,000	Feasibility Study
SDX Energy - West Garib Concession - Rabul Field	Gharib	Development Drilling & Production	58,000,000	Feasibility Study
NCIC - Nitrogen Fertilizer Complex	Ain Soukhna	Calcium Ammonium Nitrate,	800,000,000	Construction
SIDPEC - Propane Dehydration (PDH) Plant	Alexandria	Propylene	730,000,000	Feasibility Study
ECHEM - El Alamein Petrochemical and Refinery Complex	New Alamein City	Butadiene, Benzene	8,000,000,000	Feasibility Study
Apex International Energy - South East Meleiha -	Western Desert	Development Drilling & Production	100,000,000	Feasibility Study
ECHEM - SCZone Refinery & Petrochemicals Complex - Overview	Suez Canal Economic Zone (SCZone)	Petrochemicals, Refining	7,500,000,000	FEED
Nasr Petroleum Company - Fire & Gas Detection and Firefighting Systems	Suez	Offsite & Storage Tanks	21,000,000	Engineering & Procurement
PETROBEL - Nooros Exploration Prospect (Abu Madi West)	Nile Delta	Offshore Gas Field	12,000,000,000	Construction
NOSPCO - Offshore North Sinai Concession - Kamose and Tao Field Development	North Sinai	Gas Field	95,000,000	Pre-FEED
ECHEM - SCZone Refinery & Petrochemicals Complex	Suez Canal Economic Zone (SCZone)	Refining	3,000,000,000	FEED
ECHEM - SCZone Refinery & Petrochemicals Complex	Suez Canal Economic Zone (SCZone)	Butadiene	3,200,000,000	Feasibility Study
Total - OLA Energy Egypt - Mex Petroleum Zone - Alexandria Petroleum Products Terminal (APPT)	Alexandria	Gasoil	200,000,000	FEED
Eni - North El Hammad License - Bashrush Discovery	Nile Delta	Gas Field	200,000,000	Feasibility Study
Eni - Nour Gas Discovery	North Sinai	Gas Field	100,000,000	Feasibility Study
SUCO - Disouq Concession - Phase 2 - Field Development	Disouq	Development Drilling & Production	100,000,000	FEED
EGAS - Tina to Mit Nama Loop Gas Pipeline	Various	Gas Pipeline	150,000,000	Engineering & Procurement
SEMADCO - Ataka Suez Ammonia Plant	Ataka, Suez	Ammonia	600,000,000	Feasibility Study
GASCO - Raven Field to Western Desert Gas Complex	Various	Gas Pipeline	250,000,000	Engineering & Procurement
Agiba - Western Desert Gas Processing Plant	Western Desert	Gas Processing	700,000,000	Construction
ANRPC - Alexandria El Mex Complex Ammonia Plant	Alexandria	Ammonia	100,000,000	Feasibility Study

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Project Databank

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Project Focus

Compiled by Data Media Systems

GASCO - Western Desert Gas Complex - Train D

Name of Client	GASCO - Egyptian Natural Gas Company
Estimated Budget (US$)	100,000,000
Award Date	2020-Q1
Main Contractor	ENPPI Petrojet
Facility Type	Gas Field
Status	Construction
Location	Western Desert, Egypt
Project Start	2019-Q1
End Date	2023-Q1

Background

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

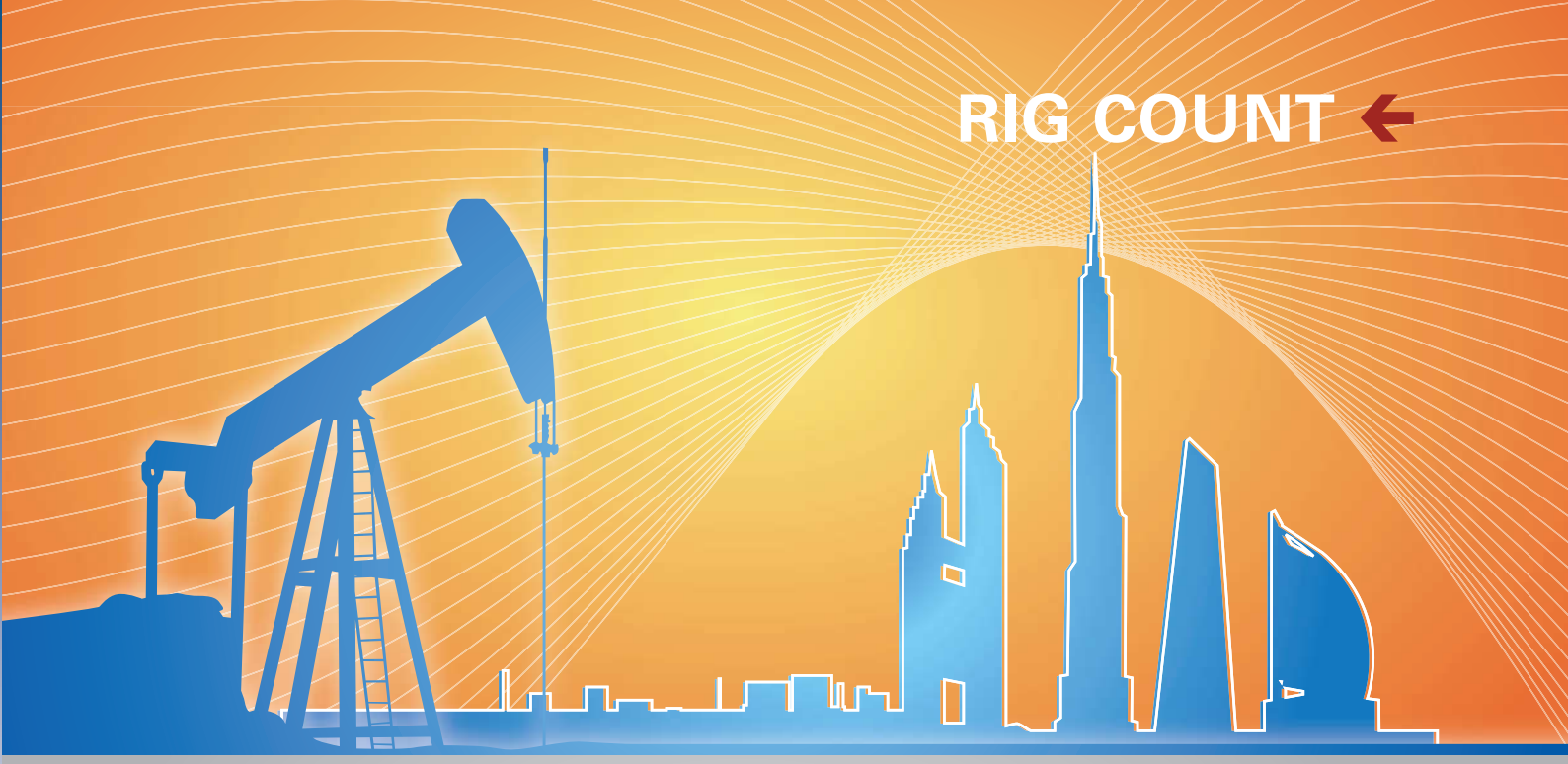
Project Status

Date	Status
Jul 2022	The civil work is ongoing. The mechanical installation is expected to begin before the end of 2022. All the project activities are being done in-house including the MAC, which is being done by ENNPI.
Feb 2022	The construction work has been started.
Nov 2021	Novargi has been awarded the design and supply of the de-ethaniser fired heater package. The package consists of the horizontal vertical cylindrical fired heater with all auxiliaries. The fired heater is equipped with natural draft burners.
Feb 2020	ENPPI will provide the engineering and procurement works, while Petrojet will provide the construction work.

Project Scope

The scope of the project includes:

- New Train D will have a production capacity of 600 MMcfd
- Natural gas processing
- Production of sales gas mainly methane from demethanizer
- Deethaniser for the production of c2c3 product
- Depropaniser for the production of propane
- Debutaniser for the LPG and condensate



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.

	JUNE 2022			VARIANCE	MAY 2022		
Country	Land	Offshore	Total	From Last Month	Land	Offshore	Total
Middle East							
ABU DHABI	35	12	47	0	35	12	47
DUBAI	0	1	1	0	0	1	1
IRAQ	55	0	55	+7	48	0	48
JORDAN	0	0	0	0	0	0	0
KUWAIT	26	0	26	-2	28	0	28
OMAN	48	0	48	+1	47	0	47
PAKISTAN	14	0	14	-2	16	0	16
QATAR	3	8	11	-1	4	8	12
SAUDI ARABIA	56	8	64	-14	64	14	78
YEMEN	1	0	1	0	1	0	1
TOTAL	238	29	267	-11	243	35	278
North Africa							
ALGERIA	33	0	33	-1	34	0	34
EGYPT	25	5	30	-2	26	6	32
LIBYA	2	0	2	0	2	0	2
TUNISIA	2	0	2	0	2	0	2
TOTAL	62	5	67	-1	62	6	68

Source: Baker Hughes

في النظام البيئي للطاقة، ولكن في القطاعات في جميع المجالات.

اللامركزية

يشير تأثير الصراع في أوكرانيا على إمدادات الطاقة العالمية إلى مشكلة أوسع نطاقا كانت تختمر منذ فترة طويلة. ففي عالم يسوده عدم اليقين، هناك حاجة ملحة إلى حل أكثر محلية حيث يتعلق الأمر بتقديم الخدمات، بدلا من الاعتماد على بنية تحتية وطنية أو إقليمية أوسع بكثير. وتتمثل مهمة أصحاب المصلحة في الطاقة في إنشاء بنى تحتية واقية للمستقبل يمكنها استيعاب تقنيات مثل التوليد المتقطع واللامركزي. ولتحقيق هذا الهدف، تشمل الحلول المجربة والمختبرة تحديد مواقع مزارع الرياح بالقرب من المناطق الحضرية أو استخدام التوليد الصغير مثل الألواح الكهروضوئية على الأسطح في مشاريع الإسكان الجديدة وتشجيع مستخدمي الطاقة على تحمل مسؤولية أكبر عن كيفية استهلاكهم لها. وتتم تغذية كل هذه العناصر في نماذج الأعمال الجديدة التي تركز على قدر أكبر من الاستدامة: خيط يعمل بشكل متزايد عبر كل مكون من مكونات المجتمع.

الرقمنة

مع استمرار الثورة الصناعية الرابعة بوتيرة سريعة، تتجه المنظمات عبر القطاعات والصناعات بشكل متزايد إلى التحول الرقمي من أجل المنافسة والبقاء. وليست الطاقة استثناءً في ذلك الأمر. ففي الواقع، ستكون رقمنة وأتمتة العمليات والممارسات في مجال الطاقة حاسمة لنجاح الجهود المبذولة لتحويل القطاع. فمن خلال رقمنة العمليات، يمكن للجهات الفاعلة في مجال الطاقة تقليل التكاليف وزيادة تدفقات الإيرادات وتقديم خدمة فائقة للعملاء. والأهم من ذلك، أن الحلول الرقمية تمكّن الشركات أيضا من تقليل الهدر وزيادة الكفاءة التشغيلية إلى أقصى حد، مع مكاسب وفوائد استدامة واضحة للبيئة.

وإشهادا على أهمية الرقمنة لنموذج الطاقة الناشئ، يكشف تقرير شركة آرثر دي ليتل أنه إلى جانب الاستثمارات الضخمة في شبكة الطاقة نفسها، فإن الرقمنة المتزايدة للعمليات والمرونة تهيمن على الاستثمارات.

قوة الهيدروجين

ومن المجالات الأخرى التي تجذب الاستثمار والاهتمام العالمي الهيدروجين (H2). ومن المتوقع أن تبلغ قيمة الاقتصاد العالمي الخاص بغاز الهيدروجين 700 مليار دولار أمريكي بحلول عام 2050.

وقد تم تحديد الهيدروجين الأخضر على وجه الخصوص باعتباره تقنية رئيسية لتلبية طموحات إزالة الكربون، ودعم الانتقال نحو مستقبل أكثر اخضرارا في القطاعات التي يصعب إزالة الكربون منها.

إن جهود البحث والتطوير التعاونية، في جميع أنحاء العالم، جارية لتعظيم إمكانات الهيدروجين في مصفوفة الطاقة العالمية.

ففي الآونة الأخيرة، تضافرت جهود الإمارات العربية المتحدة وهولندا لتعزيز جهودهما في مجال الهيدروجين، ودفع صياغة المشاريع والمبادرات لدعم اتفاقية باريس بشأن تغير المناخ. هذا في حين عززت شركة بترول أبو ظبي الوطنية (أدنوك) وشركة بي بي (بريتش بتروليوم) ومصدر شراكتها الإستراتيجية للتقدم في تطوير الهيدروجين النظيف ومراكز التكنولوجيا، ودفع الابتكار في مجال الطاقة لكل من الإمارات العربية المتحدة والمملكة المتحدة. كما أعلنت ألمانيا والمملكة العربية السعودية عن تحالف استراتيجي لتطوير الهيدروجين الأخضر، والذي سيشهد تعاون الدولتين في توليد ومعالجة واستخدام ونقل الهيدروجين النظيف.

الطريق أمامنا

في سياق أزمة المناخ وعدم اليقين في العرض، يصبح الحاجة إلى التحول في مجال الطاقة واضحة للغاية، والطريقة التي يضع بها اللاعبون في الصناعة أنفسهم اليوم يمكن أن تحدد نجاح أو فشل الجهود العالمية، هذا فضلا عن ميزتهم التنافسية الخاصة، لعقود قادمة.

ومن الهيدروجين إلى الرقمنة، توفر الرؤى التي تم الكشف عنها في تقرير شركة آرثر دي ليتل مجموعة أدوات لمساعدة صانعي القرار في القطاع على البدء في التحرك نحو رؤيتهم لمستقبل منزوع الكربون.

قطاع التنقيب والإنتاج في صناعة النفط والغاز: إيجاد طريقة للوصول إلى تخفيض الانبعاثات حتى الصفر نظرا لأن المزيد والمزيد من البلدان يضع أهدافا للوصول إلى تخفيض الانبعاثات حتى الصفر، سيتأثر قطاع النفط والغاز، بشكل متزايد، بالوتيرة المتسارعة لانتقال الطاقة، وذلك وفقا لتقرير «الاضطراب الآن». ويقدم التقرير التوصيات التالية لقطاع التنقيب والإنتاج في صناعة النفط والغاز:

- حصاد المحافظ الحالية مع التركيز بشكل أقوى على استخراج القيمة من الأصول الحالية، مع تقليل التعرض لعمليات التنقيب الحدودية أو التطورات الرائدة الطويلة.
- تحويل التركيز من السوائل إلى الغاز الطبيعي.
- تحسين استدامة العمليات الحالية: إجراءات كفاءة الطاقة، والمصادر المتجددة للاستهلاك الداخلي، وتقليل تسرب الميثان، وما إلى ذلك.
- رقمنة العمليات الرئيسية لتقليل تكاليف التشغيل وتحسين المرونة في مواجهة تقلبات أسعار النفط.
- الاستثمار في تقنيات التقاط وتخزين ثاني أكسيد الكربون وحلول تحييد الكربون الأخرى كخيار لإزالة الكربون أو تعويض انبعاثات الكربون من العمليات.
- الاستثمار في أصول التنقيب والإنتاج منخفضة التكلفة مع إمكانية الارتفاع على المدى القريب والمرونة المعيارية (على سبيل المثال، بعض عمليات النفط الصخري منخفضة التكلفة)
- عمليات الاستحواذ الانتقائية على شركات التنقيب والإنتاج المستقلة التي تقع في ضائقة مالية، لا سيما عندما يمكن التقاط التآزر التشغيلي بسهولة.
- الخروج من الأصول ذات المخاطر العالية مثل: رمال القطران أو حقول النفط الثقيلة للغاية، والأصول البعيدة في البيئات الحساسة ذات البنية التحتية المحدودة.
- الحد من الاستثمار في مشروعات الاستخلاص المعزز للنفط المعقدة / عالية التكلفة في الأصول الناضجة.
- الحد من التعرض لكتل التنقيب الحدودية أو بعض التطورات طويلة الأجل ذات الاقتصادات المشكوك فيها (على سبيل المثال، بعض اكتشافات المياه العميقة).

مفكـرة الفعـاليات 2022

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8 ـ 5	معرض غازتيك	ميلان	www.gastechevent.com
8 ـ 5	معرض التكنولوجيا المتقدمة للنفط الحامض والغاز ـ SOGAT	أبوظبي	www.sogat.org
7 ـ 6	منتدى الشرق الأوسط وشمال أفريقيا للصحة والسلامة والبيئة	دبي	www.hse-forum.com
أكتوبر/تشرين الأول			
30 ـ 11/3	معرض أديبك	أبوظبي	www.adipec.com

شركات النفط والغاز تقتحم مجالات أخرى مثل الهيدروجين

ثلاثة اتجاهات تشكل التحول في مجال الطاقة

في هذا المقال، يناقش كل من عدنان مرحابا، الشريك ومسؤول ممارسات الطاقة والمرافق بشركة آرثر دي ليتل الشرق الأوسط، وكارلو ستيلا، الشريك ومسؤول ممارسات الطاقة والمرافق بشركة آرثر دي ليتل الشرق الأوسط، كيف تؤدي عمليات إزالة الكربون واللامركزية والرقمنة إلى تحويل قطاع الطاقة.

على خلفية عالمية للأزمة البيئية والصراع المسلح، هناك حاجة متزايدة لتغيير ذي مغزى في قطاع الطاقة. فعلى الرغم من أن استمرار انبعاثات ثاني أكسيد الكربون يؤدي إلى تفاقم حالة الطوارئ المناخية، فإن الحرب المستمرة في أوكرانيا ت طرح تذكيرا بهشاشة إمدادات الطاقة في أوقات الاضطرابات.

ومع مواجهة الطاقة والنظم البيئية لمستقبل من عدم اليقين، تكون الدعوة إلى العمل واضحة: يجب على القطاع وشركائه العمل معا لتغيير طريقة عملهم. ولحسن الحظ، بدأ التغيير بالفعل كما اكتشفت شركة آرثر دي ليتل، في تقريرها الأخير «الاضطراب الآن»

https://www.adlittle.com/en/insights/report/disruption-now.

أن هناك

ثلاثة اتجاهات تشكّل جهود التحول عبر طيف الطاقة، ألا وهي: إزالة الكربون، واللامركزية، والرقمنة. ويقدم كل اتجاه مجموعة من التحديات الخاصة به، ولكن يتم مواجهة هذه التحديات ـ على قدم المساواة ـ من خلال الفرص، وعلى استعداد لاتخاذها.

إزالة الكربون

من درجات الحرارة المرتفعة إلى المناظر الطبيعية المتغيرة، تتكشف حالة الطوارئ المناخية أمام أعيننا. وقد وتم تأمين الالتزام في مؤتمر الأمم المتحدة للتغير المناخي 2021 بوقف الضرر، وربما عكسه.

ومن خلال وضع القلم على الورق في مؤتمر 2021، تعهد العديد من أكبر اقتصادات العالم بتحقيق تخفيض الانبعاثات حتى الصفر بحلول عام 2050 ومضاعفة جهودها للحد من ارتفاع درجة الحرارة العالمية إلى 1,5 درجة مئوية.

هذا ليس مجرد شأن حكومي، فهناك عزمٌ يقابله من القطاع الخاص على دعم الدول في رحلات «الطريق إلى الصفر» الخاصة بكل منها. في الواقع، وخلال مؤتمر الأمم المتحدة للتغير المناخي 2021، أعلن التحالف المالي العالمي من أجل تخفيض الانبعاثات حتى الصفر أن المشاركين فيه قد خصصوا 130 تريليون دولار أمريكي من رأس المال الخاص لإحداث تغيير ذي مغزى.

لا يمكن المبالغة في أهمية إزالة الكربون. لن يكون أقل من الاتجاه الشامل الأكثر أهمية الذي يشكل التفكير الاستراتيجي وقرارات الاستثمار للشركات؛ ليس فقط

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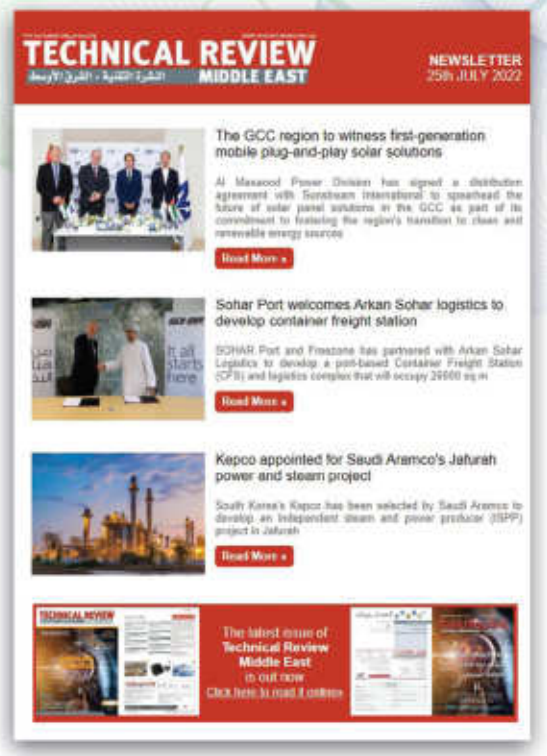

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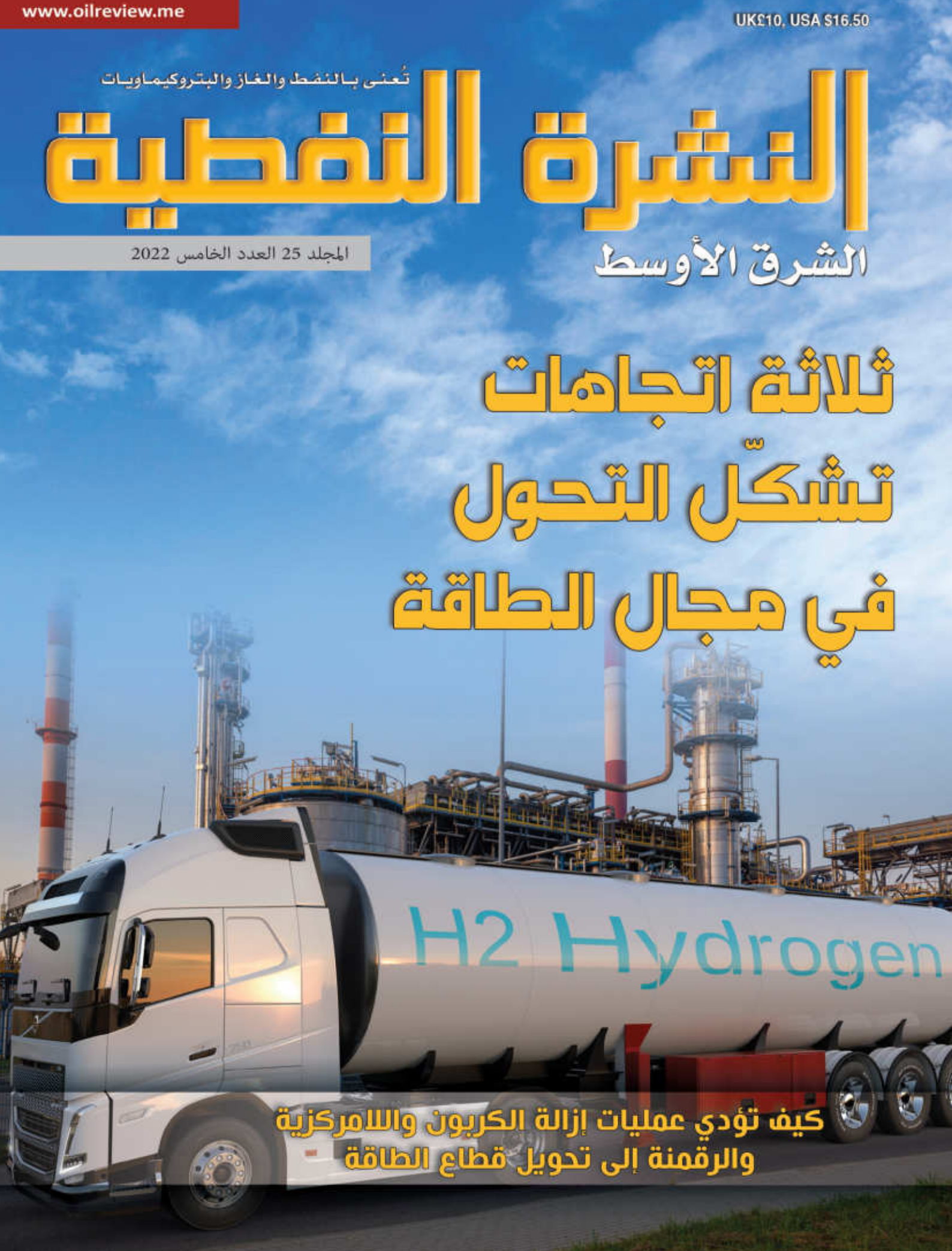

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