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ADNOC Leading transition

SPECIAL FEATURE: Digitalisation & AI

SPECIAL REPORT: Lamprell's Dubai facility

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DNV's new training hub aims to plug gap

The courses at THINK are designed to cater to various industry expertise and taught by trainers with years of field experience and still involved in real-life projects – Page 6



TAQA advances well solutions capabilities

The company has designed, engineered and manufactured special technologies and applications that have taken the well-production testing to a level of perfection – Page 15



Lamprell's facility a game changer

Foreseeing an exponential growth in the offshore wind sector, the company's automated production line is being used for serial fabrication of wind substructures – Page 24

THE TIME FOR TRANSITION ACTION IS NOW: ADNOC CEO

DUBAI: Dr Sultan Al Jaber, President of COP28, UAE Minister for Industry and Advanced Technology and Special Envoy for Climate, Chairman of Masdar, and CEO of Adnoc, has urged the world's energy leaders to act on the Dubai COP28 declaration.

"I want to keep the spirit alive and build on the momentum and the traction achieved at COP28 in Dubai. As I said after the final gavel in Dubai: We are what we do, we are not what we say. The UAE Consensus set a new direction and a clear course correction. We must now turn an unprecedented agreement into unprecedented action and results. And now is the time for all stakeholders – state and non-state actors – to step up," he said at a high-level roundtable hosted in February in Paris by IEA Executive Director Fatih Birol and attended by energy and climate leaders from around the world.

This was his first major public engagement with the energy and climate communities since the Dubai summit.

He lauded IEA for being at the heart of global dialogue on energy.

"The IEA has been a true thought leader, the IEA has been a true partner, in helping drive the conversation around a just, fair, orderly and responsible energy transition, a conversation that has always been centred around and based on the science, and laser-focused on keeping 1.5 within reach," he said.

In December, nearly 200 governments at COP28 reached a key agreement on energy and climate, often referred to as the UAE Consensus, that set new global 2030 goals of accelerating the transition away from fossil fuels, tripling renewable energy capacity, doubling energy efficiency progress and substantially reducing methane emissions.

Participants at the event identified a number of key actions that must be taken in the next year – from securing more financing for clean energy transitions, especially in emerging and



Dr Al Jaber at the IEA meeting with other world leaders

developing economies, to enhancing the next round of Nationally Determined Contributions (NDCs) that countries make under the Paris Agreement.

Countries are now beginning the process of setting climate goals that run through 2035, which will be crucial in determining the pace at which global greenhouse gas emissions decline.

Dr Birol pledged to work closely with the COP28 Presidency, as well as with Azerbaijan and Brazil, which will host COP29 and COP30.

Dr Al Jaber has been vocal about his support for energy transition, before and after COP28.

Last month, in an interview to an American broadcaster, he said energy transition means that the only source of energy that will increase over time will have to be the least carbon intensive and renewable energy.

Speaking to *CNN's* Becky Anderson at the World Governments Summit in Dubai, he said: "We believe in the transition, we embraced the transition before anyone else. And we invested

hundreds of billions of dollars in the transition and we will continue to do so."

He added: "The transition will happen in different places and different places. We have to accept the fact that the world today consumes not less than 275 million barrels of oil equivalent. With this transition, we understand that the only source of energy that will increase over time will have to be the least carbon intensive and renewable energy.

"And that's why, for the first time, a comprehensive agreement came out of a COP with a very clear target of tripling renewable energy and doubling energy efficiency by 2030," Dr Al Jaber said.

On his role as COP 28 president, Dr Al Jaber said: "The challenge of addressing the global problem drove my motivation. The leadership saw me and my team as capable of tackling it. I did not want to miss out on this opportunity of showing the world what a young nation like the UAE can actually do as a true global citizen in addressing such a global challenge."

Jafurah gas reserves swell to 229 tcf

RIYADH: Saudi oil giant Aramco has announced that there has been a major jump in the volume of proven reserves of gas and condensate in its Jafurah unconventional field which has soared by 15 trillion standard cu ft of gas and two billion barrels of condensate.

With this find, the resources at Jafurah are now estimated at 229 trillion standard cu ft of gas and 75 billion barrels of condensates, reported SPA citing the energy minister.

This landmark achievement is a result of Aramco's dedication and applying of the highest international standards in estimating and developing hydrocarbon resources," said Prince Abdulaziz bin Salman bin Abdulaziz, Minister of Energy.

Jafurah is the kingdom's largest unconventional non-oil associated gas field and it is potentially the biggest shale gas development outside of the US.

In 2020, the Jafurah field was estimated to require investments of \$110 billion.

\$300bn funds shortfall for natural gas

RIYADH: A senior industry executive has said a \$200-300 billion annual gap in global investment in natural gas development over the past decade risks supply imbalances with further price spikes globally as demand for natural gas rises in developing countries.

Majid Jafar, CEO of Crescent Petroleum, was addressing an audience of business leaders and policy makers attending the International Energy Forum annual Symposium in Riyadh.

"Clean burning natural gas is more important than ever as an enabler of the energy transition, replacing coal and liquid fuels for power generation while supporting renewables when there is insufficient sun or wind. But as demand for natural gas rises, a shortfall in investment of about \$200 billion to \$300 billion annually over the past decade will impact supply going forward," Jafar said.

"We must seek balance in the energy trilemma of affordability and availability as well as sustainability, especially in the developing world, which will be central to achieving prosperity while tackling climate change as a global challenge."

OGN talks to key players at IPTC

DOHA: QatarEnergy's announcement to expand the North Field West project will further raise Qatar's LNG production capacity to 142 million tonnes per annum (MTPA) before the end of this decade, representing an increase of almost 85 per cent from current production levels.

Saad Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of QatarEnergy, said extensive appraisal drilling and testing have confirmed that productive layers of Qatar's giant North Field extend towards the west, which allows for developing a new LNG production project in Ras Laffan.

Al-Kaabi also announced the presence of huge additional gas quantities in the North Field estimated at 240 trillion cubic feet (tcf), which raises the State of Qatar's gas reserves to more than 2,000 tcf.



Oil products carbon footprint 'larger than anticipated'

By **ABDULAZIZ KHATTAK**

PRODUCTS made from crude oil may have a significantly higher CO2 footprint than previously assumed, a report by Germany-based Nova Institute has revealed.

It cites findings from the Swissecoinvent database, a comprehensive life cycle assessment inventory that provides information on the environmental impacts of various products and services.

"This is a starting point for re-examining the impact of crude oil and fossil raw materials in detail and including them properly in life cycle assessments, since they are the main cause of human-made climate change after all," RCI said. The latest versions of the Swissecoinvent da-

tabase, which is the basis for many European LCA's, offers expanded data on the oil and gas supply chains (based on the situation in 2019), as well as the chemicals sector.

As a result of the updates, the footprint of fossil naphtha has almost doubled and those for commodity plastics have increased by around 30 per cent (polyethylene terephthalate 26 per cent, polyethylene 34 per cent and polypropylene 30 per cent).

It is expected that the carbon footprint associated with the production of fossil-based plastics will be 40-50 per cent higher than their bio-based counterparts.

Nova Institute, in 2020, founded the Renewable Carbon Initiative (RCI) to support and



speed up the transition from fossil carbon to renewable carbon from biomass, direct CO2 utilisation or recycling for all organic chemicals and materials. It currently has over 60 member companies from the entire chemical value chain from raw material to end-of-life.

ADNOC ASPIRES TO BE AN ENERGY TRANSITION LEADER

The company has demonstrated responsibility through strategic focus on gas, renewables, and global collaborations, and is solidifying its commitment to sustainable and responsible energy production

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By ABDULAZIZ KHATTAK

SINCE the pivotal COP28 conference held in Dubai in 2023, Abu Dhabi National Oil Company (Adnoc) has been on a steadfast journey to position itself as a responsible energy producer. The company's commitment to this cause has been underscored by the unwavering support of both its internal leadership and the country's leadership.

Recently, Musabbeh Al Kaabi, Adnoc's Executive Director for Low Carbon Solutions and International Growth, emphasised the company's strategic focus on gas output. The company views natural gas as a transitional fuel towards renewable energy sources.

Adnoc's international growth strategy now encompasses gas, LNG, petrochemicals, and renewables.

In a key meeting held in January, Dr Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology, and Managing Director and Group CEO of Adnoc, highlighted the increased investment in landmark decarbonisation projects, technology, and lower-carbon solutions, boosting Adnoc's position as a global energy transition leader.

Reflecting on the pivotal year ahead, Dr Al Jaber stated: "2024 is an important year for Adnoc as we further transform, decarbonise, and future-proof our business. We have been entrusted to prioritise transformational growth, accelerate decarbonisation, and drive further growth in renewables."

Underlining the importance of technology and innovation, Dr Al Jaber stressed the application of artificial intelligence (AI) to enhance performance and efficiency across Adnoc's operations.

Also in January, UAE President His Highness Sheikh Mohamed bin Zayed Al Nahyan in a meeting of Adnoc's Board of Directors directed the company to grow its diversified portfolio and contribute to a just, orderly, and equitable global energy transition.

The board praised Adnoc for its role as a catalyst for economic and industrial growth, endorsing the company's goal to drive \$48.5 billion back into the UAE economy over the next five years.

Adnoc's commitment to environmental responsibility was further solidified by strategic investments in carbon management.

The company announced a 10.1 per cent equity stake in Storegga, a UK-based company specialising in global carbon capture and storage (CCS) projects.

This move aligns with Adnoc's ambitious target of achieving a carbon capture capacity of 10 million tonnes per annum by 2030.

In December 2023, Adnoc signed a significant LNG agreement with ENN LNG, marking a 15-year commitment to deliver at least 1 million metric tonnes per annum of liquefied natural gas.

The agreement, contingent upon a final investment decision on the Ruwais LNG project, aims to make Adnoc a reliable and responsible global energy provider.

Collaborating with Mitsubishi Heavy Industries, Adnoc signed a strategic collaboration agreement to explore opportunities in global low carbon ammonia and hydrogen markets. This partnership seeks



Dr Al Jaber ... driving Adnoc's decarbonisation goals

to advance carbon-neutral solutions and contribute to the decarbonisation of hard-to-abate industries.

Adnoc's commitment to innovation was exemplified in the Adnoc Decarbonisation Technology Challenge, where the company awarded a million-dollar piloting opportunity to Revterra, a Houston-based producer of novel batteries made from recycled steel. This initiative aims to accelerate Adnoc's decarbonisation goals and support the global energy transition.

In December 2023, Adnoc achieved another milestone by commencing operations at G2COOL, the first district cooling project in the Gulf region to harness geothermal energy.

This project, located in Masdar City, further diversifies the UAE's energy mix and supports Adnoc's decarbonisation plan.

And in November last year, saw Adnoc opening 'H2GO', the region's first high-speed green hydrogen pilot refueling station.

CARBON PLATFORM

In a groundbreaking move, Adnoc has joined forces with Santos, a leading energy company, to establish a global carbon management platform that aims to facilitate decarbonisation efforts across the Asia-Pacific region.

This collaboration signifies a strategic commitment to advancing carbon capture and storage (CCS) technologies, with a focus on developing a robust CO2 shipping and transportation infrastructure network.

Building on its existing carbon capture projects, such as the Al Reyadah facility, Adnoc continues to make significant strides towards achieving its ambitious goals.

The recent agreements with 30 companies for local manufacturing opportunities, valued at up to AED10 billion (\$2.72 billion), underscore Adnoc's commitment to decarbonising operations and stimulating industrial growth in the UAE.

These agreements align with the 'Make it in the Emirates' initiative, fostering a homegrown supply and value chain while contributing to economic diversification.

In another innovative move, Adnoc has partnered with EDGE Group to deploy UAE-made drones across its onshore and offshore operations.

The collaboration aims to minimise emissions, enhance environmental performance, and optimise operations through the use of advanced UAVs.

This initiative reflects Adnoc's commitment to leveraging technology for sustain-

able practices and reducing its carbon footprint.

Adnoc's commitment to net-zero emissions took a significant step forward with the final investment decision on the Hail and Ghasha Offshore Development project.

This groundbreaking project aims to operate with net zero carbon emissions, combining innovative decarbonisation technologies, carbon capture, and clean power sources.

The project reinforces Adnoc's legacy as a responsible energy producer and contributes to UAE gas self-sufficiency and export expansion plans.

In a strategic move towards cleaner energy solutions, Adnoc awarded a critical equipment contract worth over \$400 million to Baker Hughes for its low-carbon LNG project in Ruwais.

The Ruwais LNG plant will be the first in the Middle East and North Africa to run on clean power, showcasing Adnoc's commitment to sustainability and innovation.

Further solidifying its position as a leader in carbon capture and utilisation, Adnoc, in collaboration with Occidental, is advancing a direct air capture project.

The joint preliminary engineering study for a megaton-scale DAC facility outside the United States demonstrates the companies' commitment to scaling up carbon management technologies globally.

As part of Adnoc's broader carbon management strategy, the company has announced a final investment decision on the Habshan carbon capture project, one of the largest in the Mena region.

The project aims to capture and store 1.5 million tonnes of CO2 per year, contributing significantly to Adnoc's Net Zero by 2045 ambition and overall decarbonisation efforts.

CONCLUSION

Adnoc's unwavering commitment to sustainability, technological innovation, and global collaboration positions the company as a trailblazer in the energy industry's transition towards a more sustainable and responsible future.

As Adnoc continues to prioritise transformational growth, decarbonisation, and diversification, the company stands at the forefront of global efforts to achieve a sustainable and equitable energy future.

With visionary leadership and strategic initiatives, Adnoc is not only meeting the challenges of today but also driving the industry towards a cleaner and more sustainable tomorrow.

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Adnoc is increasing its interests in the Egyptian market, which is a natural gas powerhouse in the Eastern Mediterranean and Africa. In 2022, Egypt produced more than a quarter of all African production

With eyes on gas Adnoc ups stake in Egypt JV with bp

ADNOC'S joint venture with bp in Egypt further ratifies gas as a key component of the group's growth strategy.

Last month, both companies agreed to combine their deep technical capabilities and proven track records to grow a highly competitive gas portfolio in the most populous Arab country.

This comes one year after Adnoc and bp began talks to acquire 50 per cent of NewMed Energy (formerly Delek Drilling).

According to the latest agreement, bp will have a 51 per cent stake and contribute its interests in three development concessions, as well as exploration agreements.

Meanwhile, Adnoc will own the remaining shares and make cash contributions to the partnership.

The JV is expected to be formally incorporated during H2 2024.

The concessions include Shorouk, which holds the Zohr field and where bp has a 10 per cent interest. It is operated by Belayim Petroleum (Petrobel).

In the North Damietta, operated by Pharaonic Petroleum Company (PhPC), bp has 100 per cent interest and it contains the producing Atoll field.

And in the North El Burg, operated by PhPC, bp has 50 per cent interest. It contains the undeveloped Satis field.

Also included in the agreement are the North El Tabya, Bellatrix-Seti East and North El Fayrouz exploration concessions.

Musabbah Al Kaabi, Adnoc Executive Direc-



Adnoc building its international natural gas portfolio

tor for Low Carbon Solutions and International Growth, said the announcement with bp represented a significant step forward as Adnoc builds its international natural gas portfolio.

"This progressive joint venture partnership will enhance Egyptian energy security and the economic potential of the region's most populous Arab country. Building on our long-standing strategic partnership with bp, Adnoc looks forward to continue exploring other opportunities as we collectively seek to decarbonise our

operations and lead a just and equitable energy transition."

William Lin, bp's Executive Vice-President of Regions, Corporates and Solutions, said: "This dynamic JV offers a platform for international growth that advances our longstanding and strategic partnership with Adnoc that spans over five decades. Together, we will build on the 60 years of safe and efficient operations of bp and its partners in Egypt, and continue to produce and deliver secure, lower-carbon energy in

the form of natural gas to the country."

Adnoc is increasing its interests in the Egyptian market, which is seen as natural gas powerhouse in the Eastern Mediterranean and Africa.

In 2022, for example, Egypt produced about 64.5 billion cu m (bcm) of natural gas, which is more than a quarter of all African production.

Separately, Adnoc Distribution, a group company that markets and distributes fuels, continues to invest in Egypt.

The company currently has 244 service stations in the country and the second highest after the UAE, where it has 520 stations.

Bader Saed Al Lamki, Adnoc Distribution CEO, expressed confidence in the market's potential for growth, considering factors such as population, infrastructure, and regulations.

"We do have an excellent track record in developing the fuel and non-fuel businesses, and we believe that this market has the ingredients and has the foundations to continue to grow, whether in the UAE or in Saudi Arabia or in Egypt, given the population, the infrastructure, the regulation," he told Egypt Today at the Egypt Energy Show (EGYPS) 2024

He said investment in Egypt was based on very strong fundamentals. "One, it is a highly populated country with youth that are demanding progress, demanding expansion, demanding energy. So the ability to grow is not only short-term but also long-term. The regulations are there. The Ministry of Petroleum, Engineer Tarek El-Molla, has set the right framework for investors to come here," he said.

Adnoc Drilling using mobile solar systems for remote sites

The highly mobile solar farms can be quickly deployed at remote mobile camps doing away with generators and cutting emissions

AS Adnoc Drilling works to further decarbonise its operations and support net-zero by 2045, it is using mobile solar energy farms to support remote worksites and accommodation.

Solar energy is just one of many ways Adnoc Drilling has committed to decarbonisation as part of its aim to reduce its carbon intensity.

Its mobile solar systems are up and running and these highly mobile solar farms are capable of being easily and quickly deployed at its mobile camps and are aimed at providing power supply to meet as many of the camps' requirements as possible.

Additionally, by doing away with the need for generators, these solar systems reduce not only noise pollution but also improve air quality by cutting down emissions.

As one of the Middle East's largest drilling and well completions company, Adnoc Drilling is driving sustainable growth through strategic and responsible operations.

Its sustainability strategy stands firm on three pillars: Reducing well delivery times so reducing emissions, decreasing emissions per rig, and exploring new opportunities using new energies and technology to further



Mobile solar systems will replace generators for power supply

improve sustainability and future proof our business.

Adnoc Drilling saw a period of strong growth

in 2023, all in terms of profits, resources and operations.

In 2023, it recorded a net profit of \$1.03 bil-

lion, up 29 per cent year-on-year.

The company added 14 new drilling units in 2023, including four lease-to-own land rigs, establishing one of the world's largest owned and operated fleets consisting of 129 rigs.

Adnoc Drilling's revenue for the year increased to \$3.06 billion, up 14% year-on-year.

Revenue growth was driven primarily by the Offshore Jack-up and Oilfield Services (OFS) segments, increasing 31% and 37%, respectively.

All segments grew year-on-year as the company continues to execute on its fleet and OFS expansion strategy in support of the delivery of Adnoc's production capacity target.

In 2023, it partnered with Alpha Dhabi Holding (Alpha Dhabi) to create Enersol, a strategic joint venture (JV) targeting value-accretive technology-enabled oilfield and energy service businesses globally across the OFS and energy value chain.

The JV, of which the company owns 51% of, underpins Adnoc Drilling's market-leading position as an integrated drilling services provider, powering its growth and expansion strategy by co-investing up to \$1.5 billion across OFS and energy sectors.

DNV's new training hub aims to plug skills gap

The courses at THInK are designed to cater to various industry expertise and taught by trainers with years of field experience and still involved in real-life projects on a daily basis

By ABDULAZIZ KHATTAK

DNV, a global independent assurance and risk management provider, has opened a new training centre in Abu Dhabi, UAE, that it believes will offer tailored programmes to meet the market's demands in various sectors including energy.

Programmes at the Training Hub for Industrial Knowledge (THInK) have been crafted in collaboration with employers, industry associations, and technical and management specialists.

"DNV strongly believes that investment in training allows individuals and companies to take control of their future. In today's interconnected global market, continual learning is paramount for success. The worldwide transition towards a knowledge-driven economy highlights the importance for organisations to cultivate a highly informed and proficient workforce," says a company statement.

The dedicated training facility, which is the first of its kind in the region, will offer a range of comprehensive programmes, underscoring DNV's commitment to enhancing the abilities of those entering, and already in, multiple industry sectors.

Ensuring that workers have the latest skills and knowledge is essential for businesses to thrive and create a competitive advantage in what is a rapidly evolving and challenging industry.

The hub allows participants to expand their industrial knowledge and gain valuable insights and practical experiences through a variety of courses.

THInK offers a personal and customisable approach to development, offering in-person, virtual, and hybrid training sessions.

DNV will make use of virtual reality (VR) technology to safely replicate hands-on experiences in high-risk industries.

The hub will allow access to a variety of internationally accredited courses on safety, lifting, Mobile Elevating Work Platforms (MEWP), earth moving machinery and scaffolding, among others.

Fully customised classes can be developed and adapted to meet the specific needs of clients or industries.

Each course is designed to cater to different areas of expertise and will be taught by trainers with years of field experience and are still involved in real-life projects on a daily basis.

According to Mohamed Houari, Global Managing Director of DNV Inspection: "I am very pleased with the official opening of DNV's new Training Hub for Industrial Knowledge, THInK. The hub and its programmes were developed in collaboration with industry leaders to create a dedicated learning space that can benefit newcomers and established professionals alike."

He says: "THInK will become a repository of industry knowledge that will truly allow people to realise their full potential and accelerate their development. This will be done through a combination of traditional training methods as well as innovative methodologies such as Virtual Reality and Artificial Intelligence. Last but not least, THInK is the latest testimony of our investment in UAE and our commitment to In-Country-Value."

In an exclusive interview, Hytham Rizk, Middle East Operations Manager at DNV Inspection gave further details.

Was there a need for a training hub in the region?

DNV's comprehensive market research identified several critical gaps in existing training centers:

- Discrepancy between theoretical knowledge and on-site application.
- Limited adoption of smart technology in training, hindering innovation.
- Lack of customised courses for specialised topics.



The THInK Innovate room



THInK Future ... the VR room at the hub



Houari and Rizk (right) ... training focus

- Shortage of centers providing proper coaching for young Emiratis in a rapidly evolving market.

What are some training programmes offered at the hub?

The hub offers a range of industry-specific courses, including lifting, earth-moving machinery operation, crane safety, scaffolding at all levels, specialised train-the-trainer programmes, various HSE courses, and customised content addressing specific industry demands.

Are these programmes designed to address specific skill gaps in the market?

Absolutely. Each programme is designed to bridge specific skill gaps identified through extensive market research, ensuring relevance and effectiveness.

Besides the energy sector, which other industries will the training hub cater to?

The training hub will serve diverse industries, including oil and gas, petrochemicals, renewable energy, logistics, construction, HSE, manufacturing, transport, healthcare, waste management, and marine. This includes tailored programmes for young Emiratis.



THInK Practical room for hands-on onsite training

Are there specific programmes designed for cross-industry skill development?

Yes, DNV's globally recognised brand enables cross-industry skill development through accredited programmes. Companies can send their trainers for specialised industrial training, enhancing in-house competency with DNV certificates.

Do you offer both short- and long-term courses?

Yes. Short courses typically span one to five days, while long-term programmes can last a week to several months. Course durations adhere to guidelines from local licensing authorities, international requirements, and expert opinions to ensure comprehensive learning.

How are the course durations determined, and what factors are considered?

DNV follows guidelines from ACTVET, international accreditation bodies, and expert recommendations to determine course durations, ensuring alignment with industry standards and local requirements.

For certifications, what other international associations are involved, other than DNV?

Certifications are provided by recognised bodies, such as ACTVET, Highfield International, Scaffold Training Institute, American Welding Society, Opito, Nebosh, Medic First Aid International, and Adnoc.

How does the certification process align with industry standards and requirements?

DNV, as a leader in industry standards, adheres to the highest international and local standards to ensure the certifications meet industry-specific requirements, providing trainees with a top-notch learning experience.

How is the effectiveness of remote VR training ensured, especially in a fully-immersive environment?

Remotely conducted VR training ensures effectiveness by providing trainees with the same environmental hazards and real-world scenarios they would face on-site.

This immersive experience surpasses traditional theoretical training, enhancing competency in a practical setting.

How does DNV's expertise contribute to the In-Country Value (ICV) and the knowledge transfer aspect?

DNV, being a global leader, brings expertise from over 100 countries to address gaps in areas like decarbonisation and clean energy, supporting ICV and fostering knowledge transfer in the UAE community.

Elaborate on the discussions with Adnoc Technical Center regarding training for young Emiratis? What specific programmes or initiatives are being considered?

The ongoing discussions involve long-term programmes for young Emiratis, specialised courses for non-engineers, and coaching programmes focusing on soft skills and management skills crucial for success in professional careers.

Specialist Services' facility is a milestone for in-country value

The launch of the state-of-the-art fabrication, rental and service facility in Abu Dhabi is a testament to the company's forward-thinking vision and commitment to supporting the UAE economy and diversification

SPECIALIST Services, a Centurion company, has recently inaugurated its new cutting-edge facility in Abu Dhabi, marking a significant milestone in its expansion journey.

The new state-of-the-art 50,000 sq m waterfront fabrication, rental, and service facility, located in Mussafah Industrial Area, represents a combination of innovation, capabilities, and strategic investment in the UAE's growing industrial landscape.

Boasting a substantial 110-m waterfront load-out capacity, the new facility features an extensive range of products and services.

From design and engineering to the fabrication of large technical modules and living quarters, process packages, rig refurbishment, rebuild, technical buildings and accommodation refurbishment works, modular building rentals, and a diverse range of support services, the facility is equipped to handle a vast array of projects.

Its strategic location in Mussafah, a thriving industrial hub, ensures streamlined access to its logistical capabilities, facilitating the efficient transportation of products and services across the region.

DELIVERING IN-COUNTRY VALUE

Chris Ridley, Vice President – Middle East & North Africa at Centurion, emphasises the strategic nature of this expansion. "This new robust fabrication, manufacturing, and service hub is poised to house significant projects, supporting the UAE and global markets' with access to world-class products, positioning UAE companies like Specialist Services at the forefront of global supply."

Fernando Assing, Centurion's CEO, comments: "Centurion's investment in this new world-class facility further underlines our commitment to growing our presence in the Middle East and enhancing industry efficiency, reliability, and sustainability for our customers. After acquiring Specialist Services in 2021 as part of the Group's ongoing drive to expand our geographic reach, we have continually invested in the business to support their growth and help them reach their full operational potential. We are extremely excited by the opportunities we see ahead for



Specialist Services manufactures customised local equipment rooms and technical buildings

Centurion as we continue to deliver on our expansion and diversification strategy."

The facility underscores Specialist Services' commitment to the 'Make it in the Emirates' initiative and In-Country Value (ICV) programme.

By fostering local supply chains to support UAE businesses, a robust Emiratisation programme, and innovating cutting-edge engineering capabilities and processes, Specialist Services aims to attract international investment in the UAE economy.

The company's investment in this new facility demonstrates its commitment to the local economy and to the region, focused on delivering ICV, with the new facility expected to increase Specialist Services' overall capacity in the UAE by 40 per cent.

FROM OIL & GAS TO RENEWABLES

Over the years, Specialist Services has

grown and developed its ability to build products to service the local market, while meeting international standards to attract global customers and opportunities.

During the past 10 years, the company has focused on enhancing its capabilities to provide products manufactured in the UAE to customers in a wider range of industries and end markets in addition to oil and gas.

This shift towards supporting a broader array of industries includes a focus on supporting customers from renewable energy sectors, such as hydrogen production and offshore wind.

With reference to hydrogen production, Ridley states: "We're running a programme for hydrogen packages which sees Specialist Services produce 20 to 30 modularised 5-megawatt packages. This new direction for us exemplifies the exciting opportunities we are taking advantage of to support cus-

tomers in the renewable energy space, both within the UAE and globally."

He adds: "Our hydrogen projects and Centurion's additional focus on the offshore wind sector exemplify Specialist Services' adaptability and its commitment to supporting the global transition to cleaner energy sources."

SKILLS TRANSFERABILITY

Ridley points out the importance of finding a pragmatic balance between traditional oil and gas and renewable energy, acknowledging the ongoing vital role of fossil fuels in the global energy transition.

In this context, Ridley emphasises the transferability of skills and capabilities from oil and gas markets to new technologies and directives in the renewable energy sector as a significant opportunity for Specialist Services.

This flexibility enables the company to support complex gas processing or green hydrogen projects by using and adapting four decades of knowledge and experience in engineering and manufacturing for the oil and gas industry.

The company also focuses on packaging, modularisation, and safety goals, where they want to support complex and large infrastructure projects.

Ridley states: "We see massive value in engineering and manufacturing large projects, highly technical and highly engineered modular packages, which simplify integration at installation sites, both onshore and offshore. By doing so, we are trying to support our customers by enhancing not only their productivity but also reducing safety risks."

In conclusion, the launch of Specialist Services' new facility in Abu Dhabi is a testament to the company's forward-thinking vision and commitment to supporting the UAE economy, its growth, and diversification.

By leveraging its strong and extensive capabilities and dedication to innovation and sustainability, Specialist Services is poised to play a pivotal role in shaping the future of the region's industrial landscape and contributing to its economic prosperity.



The Abu Dhabi yard's grand opening

Kanoo Energy revolutionising industrial coating applications

The company, in a new partnership with Dutch innovator Qlayers, is integrating data intelligence with the coating process to offer a transformative solution for asset protection that is well-suited to the Middle East's specific needs

IN its commitment to supporting the GCC's goal of ushering in a new age of technological advancement, Kanoo Industrial & Energy (KI&E), a key division of Yusuf Bin Ahmed Kanoo Group, is continually investing in innovative technology.

The company fully realises the potential of digitalisation in the oil and gas industry to improving productivity and profitability by streamlining operations, and even its impact on the entire value chain.

There has been increasing adoption of digital technologies in the industry, such as artificial intelligence (AI), augmented reality (AR), big data, cloud computing, cybersecurity, the internet of things (IoT) and robotics.

As such, KI&E offers a broad range of technological solutions including gas-based power solutions, nuclear, hydrogen, waste to energy, and flare to energy.

The company works with major industry names with an aim to bringing the best systems to the region. These solutions include:

- **Predictive corrosion management:** Kanoo Energy has partnered with the UK's CorrosionRADAR, which designs and supplies the world's longest-range corrosion under insulation (CUI) monitoring technology for pipelines, refineries and more.

The patented system enables the move away from manual inspection to automated monitoring, and from reactive to predictive corrosion management.

Being predictive, it offers earlier detection aids with corrosion prevention, lowering costs and risk.

- **Robotics:** Another global partner is Gecko Robotics from the US that makes some of the world's most advanced ultrasonic inspection robots.

Gecko produces high-quality data from full coverage inspections to provide unprecedented insights into current and future asset health with patented robots and software, and over 100,000 hours in the field across multiple industries.

This offers users immediate time, labour, and cost savings by reducing or eliminating the need for access requirements. It replaces conventional and slow manual or automated ultrasonic testing (AUT) methods.

Furthermore, these robots help increase safety and security. By having small inspection teams (two to three) and fewer work shifts, the robots reduce the risk of accident or security incident.

Robots scan outside line of sight reducing confined space entry (CSE).

Last but not the least, Gecko robots allows for high quality data interpretation, including doing A-scan review performed on-site for preliminary results, and complete data analysis—completed by proprietary software and reviewed by ASNT Level II and III NDT Experts.

- **Methane detection:** Kanoo Energy works with Mirico to offer unique laser dispersion spectroscopy (LDS). The UK-based company leads the way in high performance gas sensing intelligence using LDS in any weather conditions to transform productivity and deliver a positive impact on the environment.

Mirico's technology enables autonomous monitoring of fugitive emissions (Greenhouse gases) and troubleshooting of large areas to ensure the client's site and equipment are optimised and profitable.

The unique features of the LDS technology include real time, continuous gas measurement; wide area monitoring of the entire site with a single sensor; and fully configurable setup and autonomous operation; and real time localisation, quantification and visualisation through cloud interface.

It also works in a wide range of weather conditions; raises automatic alerts upon detection of anomalous events; detects a range of gasses including methane, carbon dioxide, ammonia, nitrous oxide, and hydrogen sulfide.

Another method Kanoo Energy applies to detect methane is through satellites. It has partnered in this area with UK firm Geospatial Insight, a leading provider of geo-intelligence software and services.

Geospatial Insight applies advanced technologies, including in-house developed deep learning algorithms, to produce evidence-based, risk- and climate-relevant data and solutions that enable our clients to make better business decisions.

It helps derive market-leading intelligence solutions from the analysis of satellite, aerial and drone imagery, social media and mobile device timing and positioning data.

- **Training:** Using the Knowtified AI engine, Kanoo Energy can help automate and complete the corporate training cycle to close skills gap.

This helps businesses improve productivity with knowledge transfer and competence assurance, using AI and AR.

It also helps clients share and manage their internal key learnings between teams, verify skills



The 10Q robot is redefining industrial coating

for competence assurance (in-person or remotely) and generate centralised competency reports.

For competence assurance, the AI engine can verify the skills of employees after course completion, and also generate training compliance reports.

The system also features 'Academy', which is a catalogue of eLearning courses with competence assurance and interactive micro learning courses.

QLAYERS & KANOO ENERGY: NEW PARTNERSHIP

Adding to its list of global partners, KI&E's partnership with Qlayers' underscores a shared vision for revolutionising asset integrity management (AIM) through digitalisation and automation.

This collaboration not only showcases a significant advancement for the involved parties but also sets a new industry standard.

According to Manoj Tripathy, CEO of Kanoo Energy: "This disruptive technology will revolutionise asset integrity management service business in the region.

Nitin Gaikwad, Head - Robotics Solution - Kanoo Energy, says: "Customers are looking for technologically advanced solutions with faster and better deliverables. With 10Q painting robots, we aim to achieve cost efficiency for our customers."

On his part, Josefien Groot, CEO of Qlayers, says: "Qlayers is committed to bringing sustainable solutions to the Middle East along with Kanoo energy as our trusted partner."

PIONEERING INDUSTRIAL COATING IN MIDDLE EAST

Asset integrity management in the Middle East is undergoing a significant digital transformation, spurred by the rapid evolution of data and connectivity technologies.

Traditional methods, often reactive and paper-based, are being replaced by a digital ecosystem that leverages sensors, advanced analytics, and automation.

This shift is set to drastically improve efficiency, reduce costs, and enhance asset uptime and safety, catering specifically to the unique environmental and industrial demands of the Middle East.

In the harsh Middle Eastern environment, industrial coatings are vital for AIM, protecting key infrastructure, such as storage tanks and

vessels from the severe conditions.

These coatings are for preventing corrosion, weathering, and other environmental damages, thereby extending asset life and ensuring ongoing functionality.

Given the significant costs due to corrosion, including extensive repairs and downtime, the importance of effective coating solutions in the region cannot be overstated.

Recognising the critical need for corrosion protection and the industry's push towards digitalisation, Qlayers, a Dutch innovator, is redefining industrial coating with its groundbreaking 10Q robot.

This cutting-edge technology integrates data intelligence with the coating process, offering a transformative solution for asset protection that is well-suited to the region's specific needs.

PRECISION MEETS EFFICIENCY

Traditional coating techniques, such as manual spraying, often fall short in consistency, quality, and environmental safety.

The 10Q robot addresses these challenges. This solution includes a magnetic crawler for precise application and a trailer equipped with advanced control systems.

This setup not only ensures consistent coating application but also minimises environmental impact by reducing overspray and hazardous emissions.

The 10Q robot offers numerous automation's advantages, including:

- **Speed and consistency:** The robot's advanced spray technology allows for up to 200 sq m per hour (m²/h) of application, offering a controlled, efficient solution.

- **Minimising overspray:** Its innovative spray shielding system drastically cuts down on overspray and emissions.

- **Increased efficiency:** With a 90 per cent transfer efficiency, even with variable wind speeds, the 10Q robot ensures material savings.

- **Safer workplaces:** The robot's design allows for remote operation, reducing the need for work at heights and improving safety standards.

Beyond automation, the 10Q robot incorporates a comprehensive sensor array for real-time monitoring and analysis of coating parameters.

This enables unparalleled visibility and proactive maintenance, moving from a reactive to a preventative approach in AIM.



The 10Q robot cutting-edge technology integrates data intelligence with the coating process

The Middle East will play a decisive role in driving clean tech forward, and Carbon Clean believes the region will rapidly become one of its major markets globally, Aniruddha Sharma tells **OGN**

A blueprint for carbon capture's commercialisation

By **ABDULAZIZ KHATTAK**

CARBON Clean expanded its presence in the Middle East last year when Adnoc selected its innovative modular CycloneCC technology for a project at Fertigllobe's nitrogen fertiliser plant in Al Ruwais, Abu Dhabi.

The project will be the first deployment of a 10-tonne-per-day CycloneCC industrial unit anywhere in the world.

Oil and gas companies in this region have extensive technical expertise and carbon capture (CC) experience spanning decades.

Combined with Carbon Clean's specialist knowledge and innovative technology, it is clear that such partnerships are mutually beneficial.

Collaboration is key to progressing carbon capture, utilisation and storage (CCUS) and vital to achieving net-zero targets.

"I truly believe that the Middle East will play a decisive role in driving clean tech forward in the next few years and believe it will rapidly become one of our major markets globally," Aniruddha Sharma, Chair and CEO of Carbon Clean, tells **OGN** energy magazine.

He says: "As a global business with a vision to deliver industrial decarbonisation on a gigatonne scale, Carbon Clean is very interested in sharing expertise and working with the most influential leaders.

"That's why the oil and gas and industrial sectors in the Middle East, as well as companies in the region's CCUS supply chain, have become such an important part of this conversation."

ELIMINATING BARRIERS TO WIDESPREAD ADOPTION OF CARBON CAPTURE

Some solid progress was made at last year's COP28 conference in Dubai. Importantly, it was the first time CCUS was mentioned in the final agreement, and the text clearly underscores its vital role in decarbonising hard-to-abate sectors.

Carbon capture is an absolute necessity, not just for oil and gas, but also for steel, cement and shipping, as these sectors have very limited options for near-term decarbonisation.

"Time and time again, we've heard from executives of hard-to-abate sectors that cost and space are the biggest challenges to widespread adoption. Unlike conventional approaches, CycloneCC is prefabricated, standardised and scalable, reducing the equipment size by up to 10 times," says Sharma.

Crucially, CycloneCC reduces both the overall cost and physical footprint of carbon capture by up to 50 per cent, and can be installed in a matter of days.

Sharma says their goal is to deploy CycloneCC units on an industrial scale, and the Middle East is front and centre of their ambition.

IMPORTANT NEXT STEPS

Keen to see the pledges of COP28 and other international conferences turned into real-world outcomes, Sharma says this will increasingly happen organically, as businesses act on decarbonisation plans and investors ask companies for updates on their decarbonisation strategies.

And this creates a platform for clean tech businesses like Carbon Clean.

"As we ourselves grow, there are a few key things we'll look for as a business when making long-term investment decisions. Firstly, we will double down on countries where policy and regulation are aligned, supportive and stable, says Sharma.

He says business needs to have confidence that the regulatory environment is predictable and stable throughout the project lifecycle, from inception to delivery.

"We'll continue to prioritise markets that foster a supportive environment to commercialise and deliver our technology," he adds.

Second, Carbon Clean is going to prioritise scaling commercial projects. Again, its focus here will be on investing in environments where there is strong public-private sector collaboration, in countries where it is confident that projects will be scaled at speed.

"When I co-founded Carbon Clean with my business partner Prateek Bumb in 2009, our shared vision was to mitigate the impact of climate change through industrial decarbonisation. Strong partnerships with hard-to-abate sectors in the Middle East, are essential to achieving this objective," says Sharma.

His goals for the business are quite clear:

- To be a partner of choice for companies in hard-to-abate sectors wanting to adopt carbon capture technology as part of



Carbon capture is a necessity for oil and gas



Sharma ... decarbonisation focus

their decarbonisation mix.

- To work with governments wanting to create high-skilled jobs, be a global leader in clean technology, and decarbonise their economy.
- To be the first port of call for investors wanting to capitalise on the market opportunity available to first movers in carbon capture.
- To be a magnet for skilled professionals who want to drive progress in mitigating the impact of climate change.

CONTINUING THE DISCUSSION AT IPTC

There was a palpable sense of purpose around decarbonisation at the International Petroleum Technology Conference (IPTC) exclusively hosted by Aramco in the Kingdom of Saudi Arabia in February.

Bringing together 20,000 delegates from across the global energy sector, IPTC is one of the most influential industry forums, held in one of the most important energy markets, so it was a key event for Carbon Clean to exhibit at and attend.

"At Carbon Clean, we're excited for what's to come. COP28 gave us all a call to action, and the conversations we've had at IPTC illustrate the region's commitment to delivering industrial decarbonisation on a huge scale. We are ready to play a part in that journey," concludes Sharma.



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SAUDI MADE

Gulf states increase stake in Africa's O&G resources

By ABDULAZIZ KHATTAK

OVER the past twelve months, the Middle East's oil and gas heavyweights – Saudi Arabia, the UAE and Qatar – have accelerated their involvement across Africa's energy value chain.

Beginning with diplomatic visits turning into tangible cooperation agreements and planned

investment campaigns, Gulf countries have cemented their interest in competing for Africa's untapped hydrocarbon resources, which make up around 13 per cent of natural gas reserves and 7 per cent of oil reserves globally, says a statement by Energy Capital & Power, Africa's leading investment platform for the energy sector.

• **Saudi Arabia:** With plans to invest up to \$25 billion in Africa by 2030 through its Public

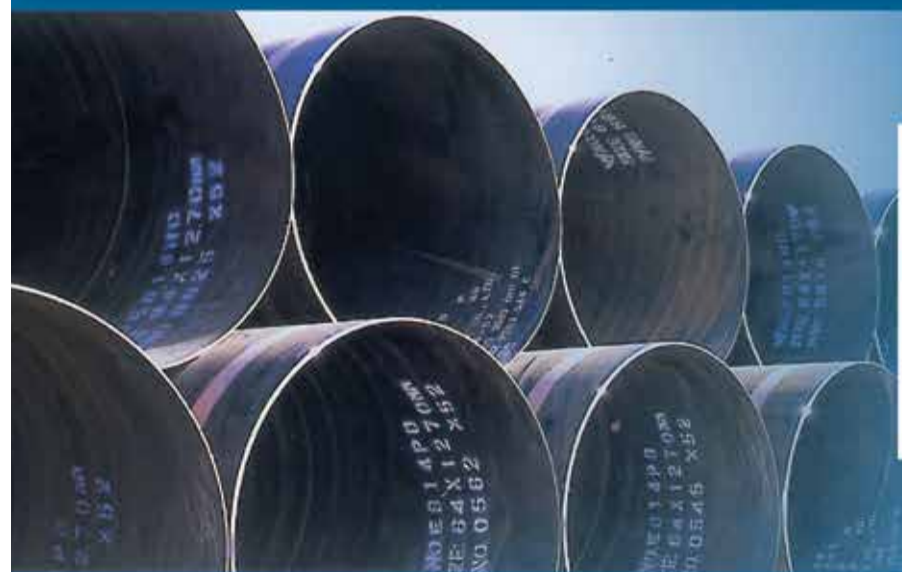
Investment Fund (PIF), Saudi Arabia is positioning itself as a long-term partner to the continent and leading integrated developments across Africa's oil and gas value chain.

Over 50 projects worth more than \$500 million were signed between Saudi Arabia and African nations in November 2023, with investments directed primarily to energy, mining and infrastructure sectors.



KSA, UAE and Qatar accelerate involvement across Africa's energy value chain

NATIONAL PIPE COMPANY LTD.



National Pipe Co. Ltd. (Known as NPC) is a major large diameter line pipe manufacturer and supplier in the Middle East with an annual production capacity of **450,000** metric ton.

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Deals included energy cooperation agreements with Senegal, Chad, Rwanda and Ethiopia, as well as a financing agreement with Mozambique for the construction of public infrastructure.

In Nigeria, Saudi Arabia has pledged to invest in the revitalisation of Nigeria's oil refineries and provide financial support to strengthen downstream capacity.

In January, the two countries launched the National Human Capacity Training Program for the Adoption of Liquefied Petroleum Gas (LPG), which is set to lead to the joint-development of micro-distribution points for LPG through Nigeria's Edo State.

Meanwhile, the Kingdom is engaging in talks with South Africa to construct a refinery and alleviate domestic fuel shortages.

• **UAE:** While Saudi Arabia may be leading diversified investment across Africa, the UAE is not far behind.

Last December, the UAE signed an agreement with Morocco for the development of the Africa-Atlantic gas pipeline, transporting Nigerian gas to North Africa, then on to Europe.

Through its Abu Dhabi sovereign wealth fund, the country will help mobilise financing for the pipeline, which could also connect emerging gas players like Senegal and Mauritania to new markets.

Seeking expansion into Africa's gas industry, Abu Dhabi National Oil Company is said to be in discussions to acquire Galp's 10 per cent interest in Mozambique's Rovuma LNG project, set to monetise three gas reservoirs in the Area 4 block of the Rovuma Basin to produce 18 million tons of LNG per year.

The UAE's growing role on the continent also transcends direct investments, enabling African countries to tap into international financial markets.

Positioned as a strategic trade centre within easy reach of the Middle East, Asia, Europe and Africa, Dubai is well-connected to both global sources of capital and emerging markets that are seeking investment.

• **Qatar:** Qatar is also ramping up its activities on the continent through upstream exploration.

In April 2023, state-owned QatarEnergy acquired a 40 per cent interest in the offshore Block C-10 in Mauritania – home to the Walata, Banda and Tevet oil discoveries – in partnership with Shell and Mauritania's national oil company SMH.

With over 28.3 billion cu m of proven gas reserves, Mauritania could become the third-largest gas exporter in Africa, following Nigeria and Algeria.

The acquisition not only affirms the prospectivity of Mauritania's offshore oil and gas acreage, but also Qatar's interest in expanding its exploration footprint on the continent.

QatarEnergy has been playing an active role in the continent's latest hydrocarbon discoveries – notably, offshore Namibia, where the company holds stakes in three exploration licenses.

Its PEL 39 – in which it carries a 45 per cent interest, in partnership with Shell (45 per cent) and the National Petroleum Corporation of Namibia (10 per cent) – has yielded four consecutive discoveries between February 2022 and July 2023.

These discoveries – Graff-1, La Rona-1, Jonker-1X and Lesedi-1X – are now transforming Namibia into one of the foremost hydrocarbon markets on the continent, with further testing and appraisal work currently underway.

Tenaris to 'revolutionise' the tubular supply chain

By **ABDULAZIZ KHATTAK**

UNDERSCORING its commitment to the UAE and its longstanding partnership with Adnoc spanning over 25 years, Tenaris has inaugurated a new Abu Dhabi industrial complex, Etihad Tubulars, with a \$60 million investment.

The facility represents the first of its kind in the UAE to thread full-length premium connections aligning with Tenaris's Rig Direct® model.

tor, Commercial and In-Country Value Directorate, and Salem Bafaraj, Adnoc Vice-President, In-Country Value and Industrial Development. Other senior Tenaris regional executives, delegates from the Ministry of Industry and Advanced Technology and international dignitaries were also present.

Commenting on the new facility, Al Mazrouei said: "Adnoc is committed to strengthening the UAE's industrial base and Tenaris' new complex in Abu Dhabi underscores our ongoing efforts to attract leading global companies to locally manufacture

critical industrial products. We congratulate Tenaris for opening this complex and look forward to continuing our partnership as we drive sustainable value for the UAE."

On his part, Rocca said: "We are delighted to be here today in the Emirates to open this latest addition to our global industrial system and strengthen our longstanding partnership with Adnoc. "With this new facility, we will contribute to the UAE's economic goals and strengthen the service we provide to Adnoc and the local energy industry."



Adnoc and Tenaris officials and guests at the opening of Etihad Tubulars

This model revolutionises the tubular supply chain through digitalisation, providing a distinctive blend of well-planning services, oil country tubular goods (OCTG) field management, and on-site running support.

"This industrial complex underscores the robustness of the company's longstanding partnership with Adnoc and reaffirms its commitment to bolstering the 'Make it in the Emirates' initiative," a company statement said.

The 200,000-sq-m industrial complex, situated in Abu Dhabi Industrial City (ICAD III) is set to foster new technical and administrative job opportunities for UAE nationals.

It also features an industrial training centre, meticulously designed for Adnoc engineers, local talents, and partners to enhance their technical skills and knowledge.

Additionally, the complex boasts a pipe service yard dedicated to the storage, inspection, and preparation of pipe products; along with an advanced premium oil OCTG threading facility.

Present at the launch of the site were Paolo Rocca, Tenaris Chairman and CEO, Gabriel Podskubka, Chief Operating Officer, Yaser Al Mazrouei, Adnoc Executive Director, People, Commercial and Corporate Support, Dr Saleh Alhashmi, Adnoc Direc-



The facility is the first in the UAE to thread full-length premium connections



The 200,000-sq-m complex will foster job opportunities for UAE nationals

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Process automation gets smarter with Ethernet-APL

Smart instrumentation, simple connectivity, fast implementation, secure operation: With its compelling performance, Ethernet-APL is preparing for a triumphant march through process control plants, Jan Strohmeier and Karl Büttner tell **OGN**

FIELD level connectivity and data access are crucial to support trends like digitalisation and Industry 4.0 which uses valuable data from the field for optimisation of processes.

Even though this is already possible with established technologies, there are limitations such as low speed, limited bandwidth, and complexity by required protocol conversions. However, all this changes with 'Ethernet with an Advanced Physical Layer' Ethernet-APL.

Jan Strohmeier, Digitalisation Manager, Endress+Hauser, Middle East, and Karl Büttner, Product Manager - Platforms, tell **OGN** energy magazine what exactly Ethernet-APL is.

WHAT IS ETHERNET-APL? IS IT A PROTOCOL?

Ethernet APL is not a protocol; it is a physical layer to connect the field device. Through the Ethernet-APL switch, the field devices are directly connected into the operation technology (OT) Ethernet backbone.

The main purpose of the Ethernet-APL switch is to provide communication and power to the field device via a two-wire cable.

On the other hand, it takes on the already known RJ45 Ethernet connection or fibre optic connections to the plant Ethernet backbone.

The communication and data exchanges are based on protocols like PROFINET or Modbus TCP.

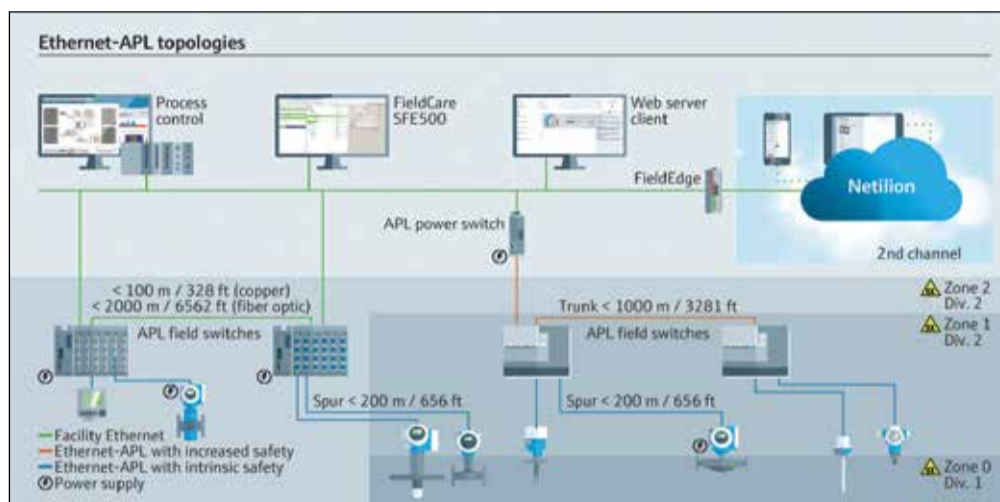
ADVANTAGES OF ETHERNET-APL

- Ethernet acts as a data highway and the content is sent in the form of packages between the source and destination. Because of this, limitation of proprietary protocols is removed.

- With this functionality the same connection can handle independent and different protocols simultaneously. This means the controller is receiving the measured value and the configuration software can access the device at the same time without any additional connection or second channel setup.

- With direct device connectivity from the controller to the field device the remote input/output (I/Os) are not required anymore.

- As there are no 4-20mA or pulse I/Os required to transfer the measured value, the cur-



The Ethernet APL topology overview

rently used setup of input cards with the correct unit and scaling is obsolete. Not only are the setup and configurations reduced on both sides, but also, there are fewer sources of failures. Due to this, field loop checking, and simulation is not required anymore during the startup phase.

- Ethernet-APL is based on 2-WISE (2 Wire Intrinsically Safe Ethernet; according to IEC TS 60079-47) and thus enables, for the first time, to not only use Ethernet over a single wire-pair, but also in hazardous areas including Ex Zone 0 and 1 or Cl. I Div 1.

HOW FAST IS THE DATA COMMUNICATION?

Each field port at the switch will connect to one field device with a speed of 10 Megabits per second (Mbit/s) full duplex.

For the backbone network, connection up to 1 Gigabit per second (Gbit/s) per ports are available via RJ45 and fibre optic.

Two ports can be used to create a network ring to have redundancy in the backbone connection (Profinet: Media Redundancy Protocol, MRP).

ETHERNET APL DEFINING THE FUTURE OF INSTRUMENTATION

- Ethernet-APL removes the need for protocol conversions and gateways, providing barrier-free and parallel accessibility and providing the extra

speed required in a data-driven economy.

- Plant efficiency is becoming an increasingly important topic in process automation. For this purpose, it must be ensured that a process plant operates reliably, provides information on future maintenance intervals for the instrumentation, is easy to diagnose in case of failures, and works with devices from different device manufacturers.

The basis for these aspects is the continuous collection and analysis of data from the installed base. Ethernet-APL supports all the requirements of a highly efficient process plant.

- This increased accessibility to each device may lead to new IIoT solutions.

WHO WAS INVOLVED IN CREATING THIS INNOVATIVE TECHNOLOGY?

Ethernet-APL with all specifications, guidelines and interoperability certification was developed in a global project setup.

This project was backed by leading industry standard development organisations like FieldComm Group, ODVA, OPC Foundation and PI (Profibus and Profinet International), as well as major industry suppliers of process automation to consider as many aspects as possible and to have a broad acceptance in the phase of implementation and roll-out.

The partners involved (in alphabetic or-

der): ABB, Emerson, Endress+Hauser, Krohne, Pepperl+Fuchs, Phoenix Contact, Rockwell Automation, Samson, Siemens, Stahl, Vega, Yokogawa.

The project was finished in 2021 and went to the standards organisations for further maintenance and caretaking.

WHEN IS THE NEW TECHNOLOGY AVAILABLE?

The technology was launched in 2021 after 6 years of preparation and standardisation.

After the launch, the manufacturers applied the standards and developed the devices.

The first Ethernet devices and network switches were released into the market in mid-2023, and the portfolios of devices from different manufacturers are increasing month by month.

CHALLENGES OF FIELD INSTRUMENTATION TODAY AND HOW TO OVERCOME THEM

Process plants today compete to produce more products with less waste, and thin profit margins require increased output yield with increasing quality.

Digital transformation has made it increasingly worthwhile for companies to consider making investments to obtain more plant data from process automation systems and instrumentation.

However, to do so, new procedures and products are required to gain access to this data from every part of the plant and to extract more value on every production run.

To do this, we need access to not only measured values but also additional data that the device produces, which, with the existing setup is not possible or restricted.

This access was extremely limited especially when we consider hazardous areas. However, with Ethernet APL, this data can be easily accessed from anywhere within the plant.

One of the options to retrieve this data is by actively connecting to the device with the configuration software.

This connection can be established either through a second channel or via the service interface at the device itself.

All the data generated in the device can give insights into the application in real time and with these insights smarter decisions can be made.

Besides, many process values can be used to improve production, for example, a Coriolis flow meter provides mass flow and density, temperature or viscosity information.

Additionally, monitoring values can be used to optimise processes, for example, information about the echo quality when doing radar level measurements.

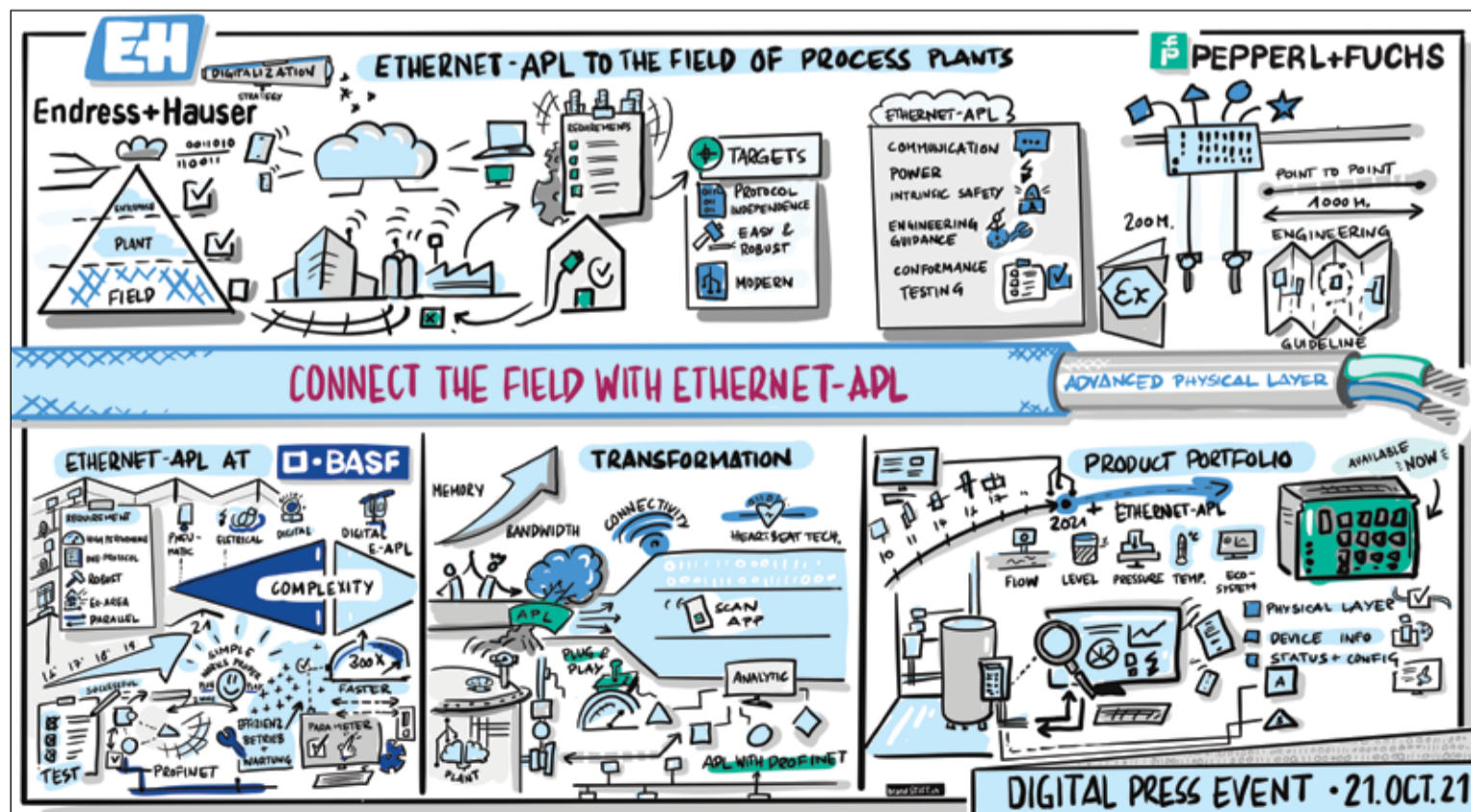
Simple connectivity of Ethernet-APL devices can be considered as one of the key features allowing us to overcome the challenge of designing a network and the complications it comes with.

With most field protocols the network needs to be designed and when in EX areas an additional EX calculation needs to be carried out to ensure the safety of the plant.

Extension or modification during operation needs planning efforts to ensure safety. These challenges of designing and modifying existing networks were considered when Ethernet-APL was designed.

Field devices are connected with a single pair cable which is a point-to-point connection from the switch port to the device. This removes any challenge for the design and even when considering the cable length, the EX-calculation is completed (2-WISE).

For any 2-wire device available today in the market, the Ethernet-APL connection will also supply the power needed to power up the device.



The Ethernet APL story in one picture

The company has designed, engineered and manufactured special technologies and applications that have taken the well-production testing globally to a level of perfection, Raid BuKhamseen, Senior Manager SAOO Account, and Syed Haider Abbas, Project Manager (DAS), tell **OGN**

TAQA takes well solutions capabilities to next level

IN its relentless pursuit to develop innovative technologies for testing the production of oil and gas wells, TAQA has not only acquired the highest tier technologies available in this field, but it has also introduced many modifications and upgrades to such technologies making them more suitable for use in challenging operating environments.

In addition, and in many special value-adding cases, TAQA has engaged in the designing, engineering and manufacturing of special technologies and technology applications that have helped to take the well-production testing globally to its next level of perfection.

TAQA WELL PRODUCTION TESTING TECHNOLOGY INNOVATIONS

In addition to the conventional well testing packages offered by TAQA which can accommodate most of the well-testing market requirements the company, in 2018, designed and manufactured a smart well test unit paving the way for the collective transition to smart well testing across the Mena region.

The development introduced to the market by the new smart well testing unit was enormous.

Once the mobile unit is positioned on the well site and connected to the well, operations can take place in a fully automated mode.

The smart well testing unit minimises the necessity for human intervention during well testing operations.

It also produces quick and interactive well-test analysis for key metrics, such as permeability, skin damage and reservoir fluids, average pressure, heterogeneities, reservoir hydraulic connectivity and reservoir boundary.

Another example of TAQA innovations in the well production testing technologies is the development and manufacturing of the Multi-Phase Flow Dynamic Simulator (MPFDS), which introduced a facelift for traditional well-testing operations.

This digitalisation approach allowed the automation of well testing workflow with very diverse data output options based on user preferred parameters and specifications.

The well production testing operations footprint has been reduced to 3 sq m, with the operation now being conducted by just two specialists thus reducing manpower requirements by more than half.

TAQA has led the transition to digital well testing across the Mena and other regions globally.

The process of simulating the multi-phase flow composition is considered to be the first-ever application of multi-phase flow prediction.

Such simulation will soon replace the need to physically measure using sensors due to its extremely accurate results meaning its output can perfectly resemble the original dynamic well conditions.

DEPLOYMENT OF UPGRADED AUTOCHOCK MANIFOLD

Automatically controlled back-pressure choke manifold was first introduced to the upstream industry as a main component in the Managed Pressure Drilling (MPD) or Under-Balanced Drilling (UBD) operations.

MPD or UBD is usually used in exploratory and delineation wells, especially gas exploration. This is done to avoid heavy reservoir invasion of mud filtrate, which can induce significant reservoir damage and risk, masking original reservoir properties and messing the reservoir or downgrading it to be classified as sub-economical.

To reduce the mud invasion, hydrostatic head pressure should not exceed the original reservoir pressure.

This is achieved by reducing the mud weight and keeping the hydrostatic column pressure slightly below the reservoir pressure while using the auto-choke manifold to apply pre-defined surface pressure, which allows controlling the pressure settings at the surface while drilling the well to be in underbalanced or at balance as required.

Lately, automatically controlled choke manifold has been introduced to well production testing services as more demanding requirements surfaced to face the well testing services.

For example, many producing wells went offline due to scale accumulation significantly contributing to a reduction in the production potential.



The auto-choke manifold



BuKhamseen and Abbas ... innovative mindset

Typically, operating companies will schedule a workover rig to visit such wells to recover the production completion, clean the well from the scale, and rerun the production completion to recommence the production.

This approach to tackling scale production typically requires significantly large scale and footprint operations, high capex, and can involve having the well out of production for up to two years or more.

The descaling operation has evolved over the years until it reached a point where the descaling could have been performed while keeping the well flowing and avoid killing the well.

So, for several reasons, the need for more proactive and slimmer operations was extreme. This resulted in the service companies adopting new and innovative rigless solutions for the scale problem by using coiled-tubing live descaling.

In this regard, the auto-choke manifold is a primary component within the surface flow back system as it is required to maintain the required surface pressure while many flowing parameters are changing during the live descaling operations.

The scales consist mainly of sulfates, sulfides and carbonates, and they can often be radioactive due to the presence of lead (Pb) isotopes.

CT Lifting of the scales to the surface depends upon the size and type of the scale and hence it requires an optimum lifting flow rate to maximise the efficiency of descaling operation.

This rate is achieved by adjusting the surface back-pressure

through choking the fluid flow using choke-manifold.

This back-pressure can increase due to the scales moving through the choke manifold and partially blocking the flow-path and causing the rise of back pressure, which in response reduces the scales lifting rate.

This results in the fallback of the scales in well-bore (struggle similar to wellbore storage effect) and can initiate slugging which requiring further remedies.

If these changes in back pressure are not countered promptly, the descaling operation cannot be completed efficiently.

This is the point where automated stabilisation of flowing pressure can efficiently take control using the auto-choke manifold as it is designed to automatically maintain the back-pressure during service operations within a predetermined pressure operating window.

It consists of two tight shut-off capable hydraulically actuated full-bore chokes that are controlled by a programmable logic controllers (PLC)-based system to maintain the selected set point pressure through the interface panel for operator to input of required settings and for displaying control system input and output parameters.

TAQA took an extra step in terms of quality by customising the material of chokes to be Inconel 625 (due to the highly erosive nature of the descaling operation) and 40 per cent H₂S tolerance.

In terms of safety, TAQA integrated an additional set of hydraulic gate valves into upstream and downstream of the auto choke manifold for remote operation and with a provision to control and monitor the whole automated operation remotely using a graphical user interface on a computer located in the lab cabin.

In terms of operational reliability, TAQA incorporated a manual control option into the auto choke manifold so that it can be used as a conventional choke manifold if required.

Moreover, the failure protocols were specially programmed to store and retain the pre-failure system settings on resumption.

The choke is equipped with redundancy of monitoring sensors and a feedback system in order to minimise the impact on the operations.

Overall TAQA's automated choke manifold is an exceptional piece of technology that is designed exclusively to handle all the possible scenarios of descaling operations and conventional testing operations as well.