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Oil Review Africa

Oil · Gas · Petrochemicals

VOLUME 16 | ISSUE 3 2021

Bonga oilfield: Nigeria's big ambition

SNEPCo MD Bayo Ojulari speaks about Nigeria's oil and gas landscape (p18)

Gas: New exploration hotbeds

Underwater Pipeline: Fusion bonded epoxy coating prevents corrosion

Technical focus: Floating production, Process automation, Offshore communications

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Nigeria is manifesting an optimistic journey. Image credit: Shell Nigeria Exploration and Production Company Ltd (SNEPCo)

EDITOR'S NOTE

NATURAL GAS IS a strong theme in Africa. This issue drills down into the continent's abundant natural gas (natgas) reserves, which, at end-2019, were reported by BP at 14.9 tcm.

Moving forward through a Nigerian lens, the hydrocarbon revenue-dependant country's oil production is beginning to slowly rise after the worldwide slump of 2020. Our cover story features the managing director of Shell Nigeria Exploration and Production Company Ltd (SNEPCo) Bayo Ojulari (p18). In an exclusive interview, he said that he is optimistic about production continuing to increase and getting very close to pre-Covid-19 levels, since more refineries are being developed in Nigeria. From the collaboration side, there is more collaboration going on in the industry now than before, Ojulari added.

Elsewhere, see page 16 to learn about some of the latest oil and gas industry standards and initiatives to develop human capital and facilitate knowledge, skills and technology transfer.

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JULY

5-8 **Nigeria Oil & Gas**
Abuja, Nigeria
www.nogevent.com

SEPTEMBER

9-10 **Angola Oil & Gas**
Luanda, Angola
https://energycapitalpower.com/event/angola-oil-gas-2021/

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22-23 **Africa E&P Summit and Exhibition**
The May Fair Hotel, London & Online
www.frontierenergy.network/events/africa-e-p-summit-2021

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www.mozambique-gas-summit.com

OCTOBER

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Nairobi, Kenya
www.expogr.com/kenyaoil

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8-11 **Africa Oil Week**
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NOG 2021 to bring government, IOCs and industry stakeholders safely and in-person this July 2021

THE ORGANISERS OF Nigeria's foremost Oil, Gas and LNG Conference and International Exhibition (NOG) are looking forward to hosting its 20th edition in person in Abuja from 5-8 July 2021, with the theme 'Fortifying the Nigerian Oil and Gas Industry for Economic Stability and Growth.'

The theme for this year's conference is in line with President Buhari's recent commitment to the 'Decade of Gas' development over the next ten years. Nigeria has a potential 600 tcf of gas and provides an enormous opportunity to diversify it's economy as the world continues to move to cleaner sources of energy.

During the NOG preliminary digital session, the Minister of State for Petroleum Resources, Federal Republic of Nigeria, HE Dr Timipre Sylva, stated, "NOG has given a unique platform for the oil and gas industry bringing together government, legislature, IOCs, services companies and indigenous players to discuss policy implementation, challenges and agree on the way forward. This also proves the level of opportunity available in our country and the positive strides we have taken as the event has grown from year to year. I therefore call on all stakeholders to come together at the 20th NOG conference to tap into the various opportunities that will strengthen the industry and the country at large."

Director, dmg Nigeria Events, Wemimo Oyelana, said, "The strategic conference this year will feature highly significant conversations that will drive forward the industry in the years to come. Our commitment to providing a platform where industry stakeholders can discuss the development and implementation of policies and solutions that deliver desired objectives for all stakeholders remain unwavering. This year is particularly important as the President has declared the next ten years as the Decade of Gas. The strategic and technical conference will be held in person, safely and securely at the International Conference Centre (ICC, Abuja) with strict adherence to COVID-19 protocols. We are looking forward to a very robust and productive conversation that will help chart the course for the future of the industry."

In recognition of excellence in Nigeria's oil and gas industry, dmg Nigeria Events will also reward outstanding organisations and individuals in the industry at the annual oil and gas awards gala dinner. Award nominations are open, all members of the industry are invited to submit their nomination at nogevent.com/award or email NOGEnq@dmgevents.com.

The event is attended by both local and international stakeholders in the oil and gas sector. Speakers at this year's event include: The Minister of State for Petroleum Resources, Federal Republic of Nigeria, HE Dr Timipre Sylva, Mele Kolo Kyari, Group Managing Director, NNPC, Engr Simbi Wabote, Executive Secretary, Nigerian Content Development & Monitoring Board and over 80 CEOs/Directors of leading International and Indigenous Oil and Gas companies with attendance from more than 25 countries.

www.nogevent.com

Axora launches global challenge for oil and gas

AXORA HAS ANNOUNCED the launch of the first international competition to discover new cost-saving digital technology for industrial companies, which can produce rapid benefits within a year. The metals and mining and oil and gas sectors have recently experienced budget cuts of 20% on average, driven by a variety of factors including the global pandemic, slump in demand and price wars. The Axora Cost-Saving Technology Challenge aims to transform these industries by discovering innovative, digital solutions that reduce cost fast and pay for themselves, whilst achieving the same or improved productivity, health and safety and sustainability standards.

Image Credit: Adobe Stock

Axora is keen to learn of any digital cost-saving innovation which meets the 12-month payback timeframe.

For further details see: https://www.axora.com/pages/cost-saving-technology-challenge/

NNPC boosts petroleum products supplies collaboration

THE NIGERIAN NATIONAL Petroleum Corporation (NNPC) has collaborated with the Abia State Government with an aim to boost petroleum products supplies to Aba Depot.

As reported in Marine & Petroleum Nigeria, the move is expected to strengthen economic activities in the area and the country at large.

The group managing director, Malam Mele Kyari, said that the meeting addressed issues on petroleum products and crude oil pipeline protection in Abia State.

The governor of Abia State, Okezie Ikpeazu, stated that the State was prepared to work closely with the NNPC and security agencies to curb the incidences of vandalisation of oil pipelines around the Abia axis which had hindered product flow to the Aba depot.

Recently, NNPC announced the achievement of a trading surplus of US$108.84mn for November 2020, a 70.33% increase compared to October 2020 sales, according to NNPC's Monthly Financial and Operation Report (MFOR).

"Crude oil export sales contributed US$73.09mn of the dollar transactions compared with US$12.38mn contribution in the previous month; while the export gas sales amounted to US$35.75mn in the month," stated the company.

Schlumberger collaborates with Amazon Web Services to deploy petrotechnical suite

SCHLUMBERGER HAS ANNOUNCED a collaboration with Amazon Web Services (AWS) to deploy domain centric digital solutions, enabled by the DELFI cognitive E&P environment, on the cloud with AWS.

This collaboration aims to bring AWS customers to the DELFI Petrotechnical Suite, which provides access to AI-enhanced applications from Schlumberger and high-performance computing from AWS's secure, extensive, and reliable global infrastructure.

"Our partnership with AWS complements our strategy to further expand access to the DELFI environment so that more customers can benefit from their subsurface data," said Rajeev Sonthalia, president, digital and integration, Schlumberger.

Image Credit: Adobe Stock

AWS's secure global infrastructure expands access to DELFI Petrotechnical Suite for more customers.

"By increasing access to digital solutions enabled by DELFI, our collaboration with AWS further unlocks opportunities for customers to continuously improve their productivity and performance."

"With AWS, Schlumberger can leverage the most comprehensive set of cloud services in the world, including AI and machine learning services that easily integrate with customer applications," said Matt Garman, senior vice-president of sales and marketing at AWS.

"Schlumberger's cloud-based solutions paired with the high performance, scalability and security of AWS cloud, increase efficiencies so customers have more freedom to innovate – and this is just the beginning. By combining our expertise, we have the potential to accelerate innovation across the entire energy sector, including new energies."

Frontier Resources announces active hydrocarbon system in Namibia

HOUSTON-BASED INTERNATIONAL gas exploration company Frontier Resources International has announced an active hydrocarbon system in Namibia while providing an operational update on its activities in the southern African country.

Frontier's Blocks 1723, 1724 and 1823 are in the Caprivi Basin in Northern Namibia covering an area of approx. 6,427 sq kms. A two-year Reconnaissance license was granted on 1 July 2019. Frontier has a strategic relationship with local company Gondwana Petroleum to provide technical services.

Image Credit: Adobe Stock

Interpretation of high-resolution magnetic data has revealed several deep-seated basement structures.

Since the issuance of the license, Frontier and its partners have gathered all available geological, geophysical, geochemical and potential field data pertinent to the Blocks.

Datasets used in the study consisted of high resolution magnetic data (200m line spacing); regional aerogravity data; topographic maps and digital geologic maps and published articles.

Interpretation of high-resolution magnetic data has revealed several deep-seated basement structures and helps to constrain the results obtained previously from existing aerogravity data.

Total starts production from Zinia phase 2, Angola

TOTAL, OPERATOR OF Block 17 in Angola, together with the Angolan National Oil, Gas and Biofuels Agency, has announced the start of production from Zinia Phase 2 short-cycle project, connected to existing Pazflor's FPSO (Floating Production, Storage and Offloading unit).

The project includes the drilling of nine wells and is expected to reach a production of 40,000 barrels of oil per day by mid-2022.

Located in water depths from 600 to 1,200 meters and around 150 kilometers from the Angolan coast, Zinia Phase 2 resources are estimated at 65 million barrels of oil.

The development of this project was carried out according to schedule and for a CAPEX more than 10% below budget, representing a saving of US$150mn.

"The successful start-up of this project, despite the challenges that have arisen as a result of the pandemic, demonstrates Total's commitment to ensure a sustainable output on Block 17, for which the production license was recently extended until 2045. Zinia Phase 2 project reflects the quality of short cycle projects in Angola with high return on investment," said Nicolas Terraz, president Africa, exploration and production at Total.

Paulino Jerónimo, CEO of the National Oil, Gas and Biofuels Agency, commented, "Zinia Phase 2 is a key project for Angola that comes at the right time to sustain the production of the country."

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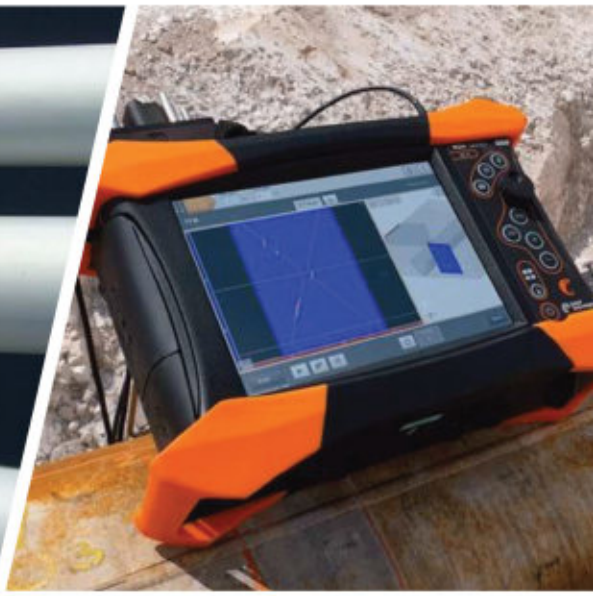

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Sub-Saharan Africa's gas production boom weighs on volatile grounds

THE NEW ENTRANT countries in sub-Saharan Africa show great gas supply potential for the region but weigh heavily on mega projects getting the green light and suppression of ongoing civil unrest and domestic instability that is hampering progress in the sector, according to GlobalData.

Sub-Sharan Africa has witnessed slow and steady growth in both demand and supply of the commodity as countries begin to develop their gas resources. The region is waiting on a significant gas supply boom coming from projects under construction and in the pipeline. However, many countries are struggling to significantly break into the expanding LNG market besides Angola and Nigeria.

Conor Ward, oil and gas analyst at GlobalData, commented, "The newcomers to the market over the next decade, most notably Mozambique, Mauritania and Senegal could bring an additional 20 mtpa of LNG to market by 2025. The majority of this new capacity is due to come from Mozambique's Rovuma LNG totalling 15.2 mtpa, however, the project continues to experience delays and it is becoming increasingly unlikely that this capacity will be seen within the decade due to ongoing instability in the country. In Mauritania and Senegal, BP lifted its force majeure last year and the long awaited Tortue project should see first LNG in 2023, adding 2.5 mtpa for each country."

There is vast potential for gas in the region.

Image Credit: Adobe Stock

Zenith Energy completes acquisition of Candax Energy's Tunisian assets

COMPAGNIE DU DESERT (CDD), Zenith Energy's fully-owned subsidiary, has completed the acquisition of a 100% interest in the fully-owned subsidiary of Candax Energy in Barbados, Ecumed Petroleum Tunisia (EPT), which holds a 100% interest in the El Bibane and Robbana concessions in Tunisia. Pursuant to the terms of the SPA, CDD acquired 100% of the issued share capital of EPT for a nominal consideration of US$100 payable at completion, as well as an additional consideration of approx. US$200,000 in the form of assumption of debt payable by the end of May 2021.

Image Credit: Adobe Stock

The initiative allows Zenith to hold an enlarged portfolio with a daily production of crude oil, natural gas and condensate in Tunisia.

Andrea Cattaneo, CEO of Zenith, commented that the acquisition of the El Bibane and Robbana concessions enables Zenith to hold an enlarged portfolio with a daily production of crude oil, natural gas and condensate in Tunisia.

"The company's focus will now turn towards beginning to exploit the significant untapped hydrocarbons production potential of our newly acquired Tunisian assets. An update in this respect will be provided in due course once we have finalised our operational working programme," Cattaneo added.

US$14 trillion gamble for upstream oil and gas

THE ENERGY TRANSITION represents US$14 trillion worth of uncertainty for upstream oil and gas, according to a new report by Wood Mackenzie.

Oil demand may continue to grow for another decade or more. On the other hand, if the world acts decisively to limit global warming to 2°C by 2050, oil demand and prices would fall rapidly later this decade. Gas demand and price, however, would be more resilient.

While this range of outcomes has major implications for the oil and gas industry, in either scenario there is still a huge amount of upstream value on the table. Using its global Lens asset-by-asset modelling, Wood Mackenzie estimates the range of pre-tax future valuations for upstream is a staggering US$14 trillion – from US$9 trillion to US$23 trillion. On a post-tax basis, operators' share of this economic rent ranges from US$3 trillion to US$9 trillion.

Wood Mackenzie vice-president Fraser McKay said, "The industry now finds itself having to supply oil and gas to a world in which future demand – and price – are highly uncertain. The range of possible outcomes is dizzying. But the world will still need oil and gas supply for decades to come, and the scale of the industry will remain enormous."

Delivery and discipline are paramount in all aspects of the upstream value chain. Performance against budgets and timelines has improved dramatically since the last downturn. The industry needs to push relentlessly to improve efficiency, drive down costs and deliver projects flawlessly.

Tower Resources set to begin first phase of exploration in Cameroon

TOWER RESOURCES, THE AIM listed oil and gas company with its focus on Africa, has announced an update regarding planned operations on the Thali license (PSC) in Cameroon, held by its subsidiary Tower Resources Cameroon SA (TRCSA), and the NJOM-3 well.

The company has received formal confirmation from the Minister of Mines, Industry and Technological Development to extend the first exploration period of the PSC until 11 May, 2022. As previously announced the company declared Force Majeure in March 2020 in respect of beginning exploration, in light of the restrictions required to combat the Covid-19 pandemic. On 31 March 2021, the company announced that the President of the Republic had also approved a formal extension of the first exploration period to next May.

Tower Resources receives formal confirmation to start exploration in Cameroon.

This formal extension allows the company to proceed with finalising a schedule for drilling and testing the NJOM-3 well.

Jeremy Asher, chairman and chief executive officer, said, "We are once again grateful to the Republic of Cameroon and to the Minister of Mines, Industry and Technological Development and his staff for their continued support of the Thali project, and also to the President of the Republic, the Secretary General of the Office of the Presidency, and the Prime Minister for taking a direct interest in our activity, as well as all the staff at the Société Nationale des Hydrocarbures, who have supported us during this first exploration period. We are looking forward to seeing the NJOM-3 well drilled as soon as possible, and we will have more news for investors about the schedule in due course."

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MAXIMISING THE VALUE OF LOW-CARBON GAS

The African continent is endowed with abundant natural gas (natgas) reserves, but upstream activity is far below a level commensurable with the region's resource base. Moin Siddiqui, economist, assesses prospects for the development of the continent's gas resources.

Image Credit: Adobe Stock

Around 41.5bn barrels of oil equivalent (bboe) were discovered across Africa in the last decade.

FOR MANY YEARS, Africa was largely ignored by international players as exploration/production (E&P) companies specifically targeted crude oil – thus natgas was (and still is) mostly vented or flared on sites (some part being re-injected into ageing oilfields to enhance their productivity), despite serious environmental impacts.

At the end of 2019, Africa's proven natgas reserves were reported by British Petroleum (BP) at 14.9 trillion cubic metres (tcm) excluding colossal offshore finds in East Africa. The International Energy Agency (IEA) in its Special Focus on Africa (2019) estimated the region's remaining technically recoverable gas resources at some 100 tcm – equivalent to 13% of global natgas resources.

Around 41.5bn barrels of oil equivalent (bboe) were discovered across Africa in the last decade. Natgas dominates over liquids, with around 73% of total discovered resource over this period, according to Norway-based energy consultancy Rystad Energy. The twin impact of low energy prices and Covid-19 recession forced major players to reduce their investment in gas (E&P) projects across all continents by 25% in 2020 – barely 20 oil and gas wells were drilled in Africa.

North and West Africa remain relatively matured in terms of exploration activity, while East and Southern Africa have been less explored and productive. Stranded gas (i.e., discovered gasfields that remain unusable for physical, logistical and economic reasons) is a target for future exploration.

New exploration hotbeds

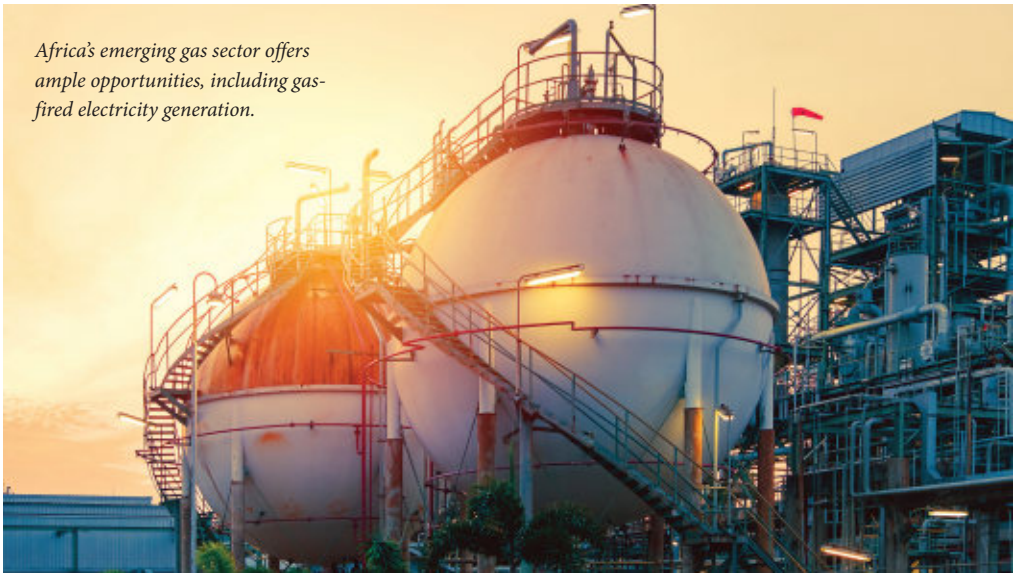
Africa's southwestern coast is home to perhaps the most globally anticipated wildcat spots following French major Total's deep-water discovery of Brulpadda (South Africa) earlier in 2019 containing 1 Bboe of gas condensate resources – representing one-fifth of the world's entire gas discoveries in 2018. Total also made a second significant find on the Luiperd prospect at depths of about 3,400 metres and encountered 73m of net gas condensate pay, making it even larger than the reservoir at Brulpadda.

Potential activity in South Africa's unconventional gas plays where enabling legislation is making some progress is encouraging. The US Energy Information Administration (EIA) estimates South Africa holds 390 tcf of technically recoverable shale gas resources – even if actual extractable gas is half that amount, shale gas could be a game-changer for South Africa, which relies heavily on gas imports.

In Zimbabwe, the US-based Invictus Energy plans a wildcat drilling programme in late 2021 on the Mzarabani-1 prospect (Rufunsa basin) at depths of 4,000m and aims to confirm prospective resources of 4.5 tcf. The operator estimates cumulative resources at around 9.25 tcf gas plus 294mn barrels of liquids. Mzarabani-1 will be Zimbabwe's second-ever wildcat since 2018.

The Senegal-Mauritanian maritime border (West Africa) has attracted keen interest over frontier discoveries. In total, the GreaterTortue/Ahmeyim acreage holds around 3.2 tcm of recoverable natural gas – split roughly half between Senegal and Mauritania (sufficient for 30-50 years production). BP's Orca-I gas Mauritanian find was both the deepest and largest in Africa in 2019, and fifth-largest in the past decade. Rystad Energy estimates Orca-1 holds around 1.3 bboe of recoverable resources.

The prolific Rovuma basin –



Africa's emerging gas sector offers ample opportunities, including gas-fired electricity generation.

Image Credit: Adobe Stock

straddling maritime borders of Mozambique and Tanzania is one of the globe's most promising new frontiers of gas production with estimated >150 tcf of proved reserves (mostly in Mozambican territorial waters). Mozambique enjoys Africa's biggest untapped gas potential. It currently has three liquefied natural gas (LNG) projects – Mozambique LNG (12.88mn tonnes per annum, 2023), Coral South floating LNG (3.4mntpa, 2023) and Rovuma LNG (15.2mntpa, 2024), which are covered by long-term offtake agreements with Royal Dutch Shell, China National Offshore Oil Corp; and Électricité de France S.A.

Mozambican gasfields could generate some US$100bn over the next 25 years. However, gas resources are in the remote and sparsely populated north where security risk casts a shadow on long-term investments. In neighbouring Tanzania, a total of 16 discoveries were made in 2010-2015, which boosted aggregate gas reserves eightfold to more than 40 tcf.

But extracting offshore gas remains a challenge, for instance, Tanzania's largest gas find Zafarani was drilled in water depth of 2,400m, whilst Rovuma fields in offshore Mozambique are within the 1,000-1,500m range. Thus, higher extraction costs of ultra-deepwater fields puts Tanzania at a competitive disadvantage to Mozambique, although security is better.

Commercialisation of gas

Global natgas demand is projected to exceed both oil and coal by 1.6% each year for the next five years (IEA), as countries seek to meet rising energy demand and wean their industrial and power sectors off dirtier diesel fuels.

Africa's emerging gas sector offers ample opportunities, including gas-fired electricity generation – scope for independent power producers (IPPs); midstream gas infrastructure (pipelines, gas processing and transportation) to monetise recent discoveries; engineering and construction of LNG plants for both export and import; developing gas-based industries (e.g. methanol, fertilisers, urea); and updating local skills and knowledge transfer from foreign energy companies.

In the Africa Energy Outlook 2021 report, the African Energy Chamber (AEC) forecasts increased gas monetisation fuelled by decarbonisation and industrialisation. "Only stronger monetisation of gas at home could justify using Africa's gas reserves for industrial and power generation purposes instead of burning and wasting them. Africa would not only reduce its carbon intensity, but also become more attractive to global investors seeking to allocate capital to the least carbon intensive projects possible."

Monetising gas also supports climate-resilience goals (aligned with the Paris Agreement) given the continent's excess flaring intensities. While Africa benefits from conventional and easy to extract hydrocarbons, the inability to prevent gas flaring makes Africa the least carbon efficient continent at around 31 bcm CO_2 emitted per barrel of oil equivalent produced, according to AEC.

Nigeria has yet to capitalise fully on its potential: proved reserves total 200 tcf with a further 600 tcf of estimated unproven reserves, according to the Nigerian National Petroleum Corporation. However, efforts to reduce flaring are making notable progress. According to the Global Gas Flaring Report (2021), the amount of gas flared in Nigeria fell 70% in 2020 to just 7 bcm – hence increasing marketed gas production. In 2018, the value of gas flared was estimated at US$1.8bn.

Some big-ticket projects are being implemented, for instance, Seplat Petroleum's planned US$700mn gas joint venture with the state-owned Nigeria Gas Company in Imo state; and the Assa North-Ohaji South plant will process wet gas from Niger Delta oilfields with a capacity of 300mn ft/day. The latter is one of seven projects promoted by the government in 2018 as critical to tackling a looming supply gap. They were fast-tracked to provide 3.4bn ft/d of gas to provide feedstock for 15GW of generation.

New supply

Gas production in Africa is expected to rise significantly in coming years with new supply originating from Tanzania, Mozambique, Senegal, Mauritania and South Africa (the IEA envisages gas output doubling between 2018 and 2040). The region could become a key supplier to the global gas market. The existing LNG capacities (exclusively located in West Africa) amount to 33 mtpa.

The likely first phase of LNG projects in Mozambique/Tanzania and Senegal/Mauritania will increase sub-Saharan Africa's total capacity to 60-75 mtpa over the next decade. Depending on unprecedented capital investment, East Africa's reserve base could theoretically support an output of up to 100 mtpa (the equivalent of Qatar's current production).

The IEA report Special Focus on Africa concluded "Recent major discoveries present a renewed opportunity for gas to support Africa's energy and industrial development. But that depends on countries with gas putting in place well-articulated strategies to turn discoveries into production and to build infrastructure to deliver gas to consumers cost-effectively in a competitive global LNG market."

Gas-to-power initiatives across Africa will underpin growth in gas production in the near future. Gas monetisation remains a major regional priority.

Moin Siddiqi, economist

EGYPT IS MORE RESILIENT

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

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

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

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

Exploration in the Mediterranean and Red Sea

The Egyptian Ministry of Petroleum and Mineral Resources announced a

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

One such area is the North Ras Kanayis Offshore block, located in the Herodotus Basin, which covers an area of 4,550 sq km, extending 5-150 km from the shore with water depths ranging from 50-3,200 m. Total is leading a consortium to explore the block, which will consist of a 3D seismic campaign being carried out within three years. Total will hold a 35% stake in the consortium, which also comprises Shell (30%), KUFPEC (25%), and Tharwa (10%).

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

Eni discovery in the Western Desert:

This fresh phase of exploration came soon after Eni announced the successful discovery of oil through the Arcadia 9 well in the Western Desert. Drilled on the Arcadia South structure, located 1.5 km south of the main Arcadia field already in production, the well encountered an 85 ft oil column in the Cretaceous sandstones of the Alam El Bueib 3G formation. Following this discovery, two further development wells, Arcadia 10 and Arcadia 11, have been drilled both of which also encountering respective oil columns. The new discovery will add 10,000 bpd to Eni's gross production in the Western Desert.

Egypt is focussing more emphasis on developing its oil and gas sector.

Image Credit: Adobe Stock

United Oil and Gas PLC spudding commences:

Also targeting the Alam El Bueib reservoirs at a depth of 3,600-3,950 m, the United Oil and Gas PLC has begun spudding the ASH-3 vertical well. This comes with high hopes after the ASH-2 production well, which came onstream at the beginning of 2020, has produced more than 1mn bbl to date, with current rates of 4,500bpd. The CEO of United Gas and Oil PLC commented, "It is equally pleasing to be back drilling in Egypt again, after the deferral of the majority of the 2020 drilling programme due to the low oil price environment, and we look forward to the drilling of further wells as part of our 2021 campaign."

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

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

> **"Total is pleased to further strengthen its Eastern Mediterranean position as an operator of this exploration and production agreement," Kevin McLachlan, senior vice-president of exploration at Total."**

BP announces gas production from Raven field

BP has announced gas production from Raven field, the third stage of its major West Nile Delta (WND) development off the Mediterranean coast in Egypt.

The approximately US$9bn WND development includes five gas fields across the North Alexandria and West Mediterranean Deepwater offshore concession blocks in the Mediterranean Sea. BP and its partners, working with the Ministry of Petroleum, have developed the WND in three stages.

Raven follows the Taurus/Libra and Giza/Fayoum projects, which started production in 2017 and 2019 respectively. It produces gas to a new onshore processing facility, alongside the existing West Nile Delta onshore processing plant.

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DRIVE FOR EXPANDING INDUSTRY STANDARDS AND INITIATIVES

Many companies are adopting integrated strategies to deliver real-time and targeted training for the oil and gas workforce.

A NUMBER OF AFRICAN countries are encouraging local content requirements as a means to boost the in-country economic value chain. Africa is seeing joint collaborations and partnerships that aim to expand natural gas and oil industry standards and initiatives.

One of the most recent is, in March 2021, the American Petroleum Institute (API) and the African Energy Chamber (AEC) signed a MoU to oil and gas industry standards. The MoU is expected to facilitate collaboration between API and AEC members in several areas, including development of training programmes and seminars; coordination, collaboration and sharing of the natural gas and oil industry's good practices for environmental, health, safety, security and sustainability.

The importance of upskilling oil and gas workforces has been highly acknowledged too by the Senegalese President HE Macky Sall who is seeking to ensure a swifter progression of oil and gas projects in the country. During a virtual conference held with the Council of Ministers in February 2021, HE Sall urged government to support the establishment of the National Institute of Oil and Gas, as well as formalise regulations related to education and training in the sector, in a bid to develop human capital and facilitate knowledge, skills and technology transfer.

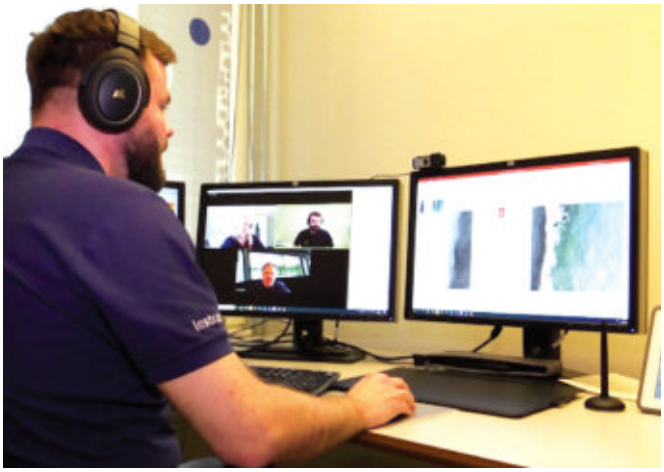

Image Credit: Kongsberg Maritime

Kongsberg Maritime instructors conduct courses in real time in virtual classrooms.

Trends in Africa's oil and gas recruitment

Jozsef Marton, managing director, London, Preng & Associates, the global energy search leader, spoke about the top five sectors in oil and gas which will see more recruitment drive in the coming days. According to him, in the upstream segment, production operations will be a top sector in driving recruitment. "Every company needs to make their production as efficient as possible and as high as possible. Then comes financial skillsets. While doing deals or partnership agreements, ensuring that right commercial agreements put in place is going to be critical to make sure companies can make money. Third one is managing government relationships. This is going to be critical because due to COVID-19, a lot of governments, particularly in Africa and other emerging markets, are put under pressure. Companies need to find people who can manage that pressure and ensure relationships are strong and positive. The fourth segment is attracting the next generation leaders."

"In the next five years, a lot of people are going to retire from the industry or can not be in the leadership roles. A big challenge is how to replace those individuals. Hence, the competition for talent is going to increase. The fifth call is around the ESG agenda. People are still working out what ESG means for a particular company and how it can help improve performance and attract new investment. Therefore, finding people who really understand those areas are going to be crucial."

Training options

Thus, the scale of many oil and gas training and standards is enormous. Energy services company Wild Well Control offers WellSharp Live: an IADC-approved distance learning training delivery option for all WellSharp Drilling and Well Servicing well control courses. WellSharp Live has been developed as a temporary solution to support ongoing training and learning in the oil and gas industry during the COVID-19 crisis.

The option allows for instructor-led delivery, an interactive learning environment, and real-time quality monitoring throughout the course. Online proctoring services will also be utilised during course assessments. When normal operations resume, WellSharp Live will revert to instructor-led, in-room classes as the only delivery option for WellSharp training.

In addition to this, Norwegian technology enterprise Kongsberg Maritime has announced an integrated strategy to deliver remote, targeted training for its customers. Providing this service through digital platforms reduces travel, cost, time away from home and climate footprint. Three products – Remote Training, e-Learning and K-CAT (Kongsberg Competence Assessment Tool) – combine to ensure that vessel crews can fully benefit from KONGSBERG's expertise from the convenience and safety of their homes or offices.

BRINGING CONNECTIVITY TECHNOLOGY FOR ENERGY SUPERPOWERS

For more than 10 years, Speedcast has been developing and implementing telecommunications and technology systems that are vital to construction, operation and maintenance for workers across the region.

OVER THE PAST 15 years, major oil and gas companies have entered Mozambique to develop the vast infrastructure needed to turn gas in the sea bottom into LNG product. Offshore platforms, pipelines, processing and storage facilities, export terminals and living facilities for staffall support the country's economy-changing transformation into the world's fourth largest exporter of LNG. As with all energy and drilling operations around the world, secure, reliable communications is essential to ensure safety and a steady pace of operations. Within Mozambique, however, the infrastructure needs to be built, since this is a green region ripe with unchartered opportunity for major energy projects.

Image Credit: Adobe Stock

Speedcast is implementing strict actions to ensure a safe work environment in this challenging landscape.

"To obtain connectivity in an area with limited or no land-based communications infrastructure in place, many local businesses rely on multi-megabit VSAT capacity to connect to the rest of the world."

To obtain connectivity in an area with limited or no landbased communications infrastructure in place, local businesses and residents rely on multi-megabit VSAT capacity to connect to the rest of the world. For Rovuma Basin projects, satellite is an interim solution that will eventually transition to backup and disaster recovery networks, replaced by new subsea fiber cable: a diverse, self-healing, fault-tolerant design that will provide highly secure communications, analytics, network management and optimisation.

These projects do more than support major operators' plans to implement LNG. By hiring thousands of local workers and partnering with local IT and telecommunications businesses to help bring systems and services online, the regional economy's growth is thriving, and these opportunities are giving local people a stake in the energy future of the nation.

Speedcast's expertise in digitalisation enables use of the best available technologies to support pioneer operators as they focus on building Mozambique's energy exploration operations, and as one of the only telecommunication service providers in the region with a local entity (Speedcast Mozambique Lda.) as well as local licenses to provide internet and voice services, the process for doing business in Mozambique is simplified. As with all energy operations around the world, strict attention to health and safety regulations are top priority to ensure a safe work environment in this challenging landscape. Speedcast is backed by a global field support team with a demonstrated track record of success in both established and newly-developing regions.

www.speedcast.com

SNEPCO: POWERING PROGRESS FOR A SECURE ENERGY FUTURE

Managing Director of Shell Nigeria Exploration and Production Company Ltd (SNEPCo), Bayo Ojulari, explains how the Nigerian oil and gas sector can return to pre-Covid levels of production through collaboration, new technology and incentivising investment. Ojulari speaks exclusively with Robert Daniels and Deblina Roy.

Robert D: At the recent Baker Hughes Rigs versus Riserless webinar, in which you participated, it was deliberated how riserless technology could provide tangible benefits to well intervention operations. How much has SNEPCo utilised riserless methods and are you inclined to make more use of this in the future?

Ojulari: SNEPCo has successfully deployed riserless technology as far back as 2011 where we tried the technology using slickline on the flagship Bonga deep-water asset, which was very successful. After 2011 trial we entered an four to five year-long in-field development drilling campaign. At some point, we had two rigs drilling in the field, these provided the major well intervention capabilities during the period, while minor well maintenance type interventions were done with a vessel of opportunity.

By 2017, we had an optimised version of riserless technology that was successfully used for acid stimulation, additionally we performed five well suspensions and one subsea tree change-out – all of which were done successfully without any major safety incidents. In 2019, we successfully executed another three-well intervention campaign using riserless well control systems developed in-house.

Image credit: SNEPCo

Bayo Ojulari is the managing director of SNEPCo.

Due to the cost-efficient benefits of riserless technologies, it is indeed the foundation of our well intervention strategies going forward. We are looking to collaborate with qualified service providers in this area and have listened to presentations from Baker Hughes and others whom we look forward to working with in the future.

Robert D: Sub-Saharan Africa will have the oldest average age of wells in the world by 2025. How do you deal with this challenge and the fact that wells are reducing in production?

Ojulari: The ageing nature of wells in Sub-Saharan Africa, combined with the fact that remaining infill new oil opportunities are even more technically challenging to develop, means our intervention philosophy needs to be a lot more pro-active to secure and improve our base production levels.

There are two elements to keep in mind here, one is around some fields in development with sub-economic lifecycle operating costs. With the riserless technology as a cheaper, more efficient intervention technology, I see some of these fields or reservoirs that have not been developed, coming into development.

The second element has to do with wells that are already developed but have declining production. So, a well that was doing 10,000 bpd initially is now doing something like 2,000 bpd. At these levels, you can't afford the very heavy intervention systems anymore. So, over the last five years we have seen the riserless technology taken up

more in sub-Saharan Africa and in the next five years, I envision the demand almost doubling.

Deblina R: Do you think there is enough collaboration in the industry at the moment and how would you encourage more of it?

Ojulari: There is more collaboration going on in the industry now than in the past. In fact, SNEPCo is currently collaborating on a joint intervention campaign this year where we have four companies jointly collaborating to reduce the mobilisation costs and the overall cost for the programme this year. We are also discussing future campaigns with other operators to explore mutually beneficial opportunities.

The equipment sharing opportunities are not yet as well-structured as I would like to see especially compared to other oil provinces like the Gulf of Mexico. This is one area which could be improved through the development of a structured industry-wide collaboration framework, agreed by all key stakeholders. This would involve more transparency of well intervention activity plans, improvements in supply chain and vessel availability, and potentially a simplification and improvement of the contracting process for more strategic opportunities of this sort.

Additionally, we need to have discipline to improve execution planning so that everyone sticks to their slots on the execution sequence. This is so everybody involved in the collaborative solution feels they are being treated fairly and have the motivation to sustain collaboration. If you have collaboration which is a bit of a win-lose, it discourages others and they may want to go on their own which will break down the whole collaborative framework.

> **"The current version of the PIB addresses a lot of fundamental regulatory issues required to unlock the huge potential of hydrocarbon resources in Nigeria. However, more needs to be done to better commercialise the Gas value chain and explicitly preserve the earned rights of current businesses."**

Deblina R: Nigeria's oil production is beginning to slowly rise after the worldwide slump of 2020 but there are suggestions this could take some time. Do you believe production rates will get back to pre-Covid levels and how can this be achieved?

Ojulari: My expectation is that Nigeria's production will indeed continue to increase and, although it may not get to exactly to pre-Covid levels just now, it will get close. The reason for this is that apart from exporting crude, the trend we are also seeing is that more refineries are being developed in Nigeria. We have the major oil refinery in Lagos, the Dangote Refinery, and we also have several other modular refineries that are coming up in the country.

There are also opportunities in gas utilisation with respect to building a gas-based industry which is brewing. We are seeing an increase in investment around production of methanol, ammonia and other fertiliser. I also envision utilisation within sub-Saharan Africa increasing because more local refineries and gas-based industries are coming up which will lead to sustained demand for oil and gas.

Robert D: How far do you think the Petroleum Industry Bill (PIB) addresses the need for clear policy direction with regards to oil and gas framework in Nigeria and do you think it is enough to encourage investors to develop more projects in the country?

Ojulari: There are a lot of positives with the current version of the PIB. For instance, it is addressing some fundamental issues around the regulatory framework that is required to unlock the huge potential of hydrocarbon resources in Nigeria. But we have also identified several issues with the bill in its current draft form which need to be addressed for Nigeria to compete globally for scarce investment. Without going into details, I will give three examples of areas where the PIB needs to do better to truly attract investment:

One, the current version of the PIB has inadequate Gas fiscals and related pricing mechanisms, and lacks a robust Infrastructure development framework – this is required to stimulate the domestic gas value chain to power Nigeria's socio-economic development

Two, the total royalty provisions are worse and do not do enough to encourage investment in deep water. Interesting to note that between 2015 and 2019, Nigeria only received 4% ($3 billion) of $70 billion invested in oil and gas projects in Africa despite having the largest reserves. Deep-water non-associated gas resource development is particularly challenging and requires targeted measures to get projects off the ground including a low royalty regime during the early years, and generous production allowances.

The number three example has to do with people who have already made investment decisions and are currently operating in Nigeria with international investments and funds. We believe that the conditions for conversion of the existing commitments into the PIB terms as currently stated are too harsh on existing businesses and could negatively impact investor confidence. It is very important that the PIB explicitly preserves base business and earned rights of current businesses.

Robert D: In terms of business continuity, what changes have you been witnessing over the last few years?

Ojulari: Through a global lens, the increased societal expectation for cleaner energy solutions in line with the Paris agreement to limit global warming is a critical element that we are seeing as a big trend change.

The other thing we are seeing is that oil price volatility remains a major trend that is influencing decision making on investments and policies. On the supply side of that, we see the rise of shale oil in North America and the competition for market share with OPEC countries. Then when you come to the demand side, you see the impact of Covid-19 on industrial energy consumption which has really impacted on price.

Also important to note is the

> **"There is more collaboration going on in the industry now than what it used to be. We are already discussing campaigns with other operators to explore mutually beneficial opportunities."**

rise of digitalisation as a key lever which is transforming the energy system and driving significant business value. For example, our Bonga deep-water FPSO asset including the subsea, topside and the processing facility has a digital twin. Before now if we wanted to do major maintenance on this FPSO, people had to fly offshore with all the safety requirements and do measurements and inspections. Today, we just interrogate the digital twin and do all the pre-work we need to do, which optimises the actual execution.

Through a Nigerian lens, there are a lot of Upstream assets that were acquired by local operators, leading to deeper indigenous participation than ever before. We see more of that happening, changing government regulations, just like the Deep Offshore Act that was amended in 2019, the Finance act in 2020, and the PIB, however, there are still a number of critical issues need to be addressed in order to unlock the next phase of oil and gas investment in Nigeria especially deep-water oil and gas development.

One other important thing I would like to mention is the significant final investment decision taken on the Nigeria LNG (Train 7). This has unlocked a lot of upstream projects as well.

Deblina R: How is Shell Nigeria taking initiatives that add value to the local content development and boost the country's economy?

Ojulari: SNEPCo, and indeed Shell companies in Nigeria have been at the forefront of efforts to localise our business, people, processes, and supply chain. It is worth mentioning that Shell companies in Nigeria were judged as the IOC with the most impactful local content initiative in the upstream category at the 2019 edition of the Nigerian Oil and Gas Opportunity Fair, by the Nigeria Content Development and Monitoring Board (NCDMB).

With respect to localisation of supply chain, we have been supporting local contractors over the years to substitute foreign services and capacity with local alternative through deliberate capacity building. I will give you a couple of examples:

Shell supported the development of a Nigerian company called Nigeria Machine Tools Limited and we are using their nuts and bolts at Bonga and at most of our offshore facilities because they can produce to a high standard.

In addition, there is an ongoing effort to enable Nigerian manufacturers to achieve the international certification for their products. We've used our global presence to ensure that our local companies get access to international bodies for recognition. For one of our deep-water assets, Bonga, three of the topsides modules were designed and manufactured here in Nigeria. We also supported an indigenous air logistics service provider, Caverton, in their acquisition of six units of AW139 Helicopters for their fleet. We are also sponsoring research by local universities for the substitution of imported drilling fluids with locally produced alternatives.

> **"The ageing nature of wells in Sub-Saharan Africa means our intervention philosophy has been a lot more pro-active to secure and improve our base production levels."**

Deblina R: How did the Nigerian oil and gas industry deal with the Covid-19 pandemic and how should it prepare for future crises?

Ojulari: Shell reacted quickly implementing several measures such as the development of a combination of controls. This is built on the principle that dealing with pandemics is not just one solution, you need multiple solutions. We talk about hygiene, social distancing, testing and logistics on the preventive side. We have enforced quite a few preventive measures such as making sure that before people go offshore, they go into quarantine, where they are observed and tested at least twice for Covid-19, which also provided a check on the overall health status of our staff. On the response side, we make sure when people work, they do so in a bubble.

Before the pandemic, most of our rigs or offshore vessels had no specific isolation areas. Today we have designed dedicated locations to isolate people in the event of an infection. That way if there is any problem even before the tests are performed, suspected cases can be isolated. Our control measures are proving to be effective such that we have not had any outbreak of coronavirus on any of our facilities in Nigeria in the last three months.

It is one thing to have controls in place, but people are human, and they will make mistakes. We recognise this vulnerability and have put in place additional measures for independent spot checks that help ensure the controls are in place and are complied with. I would say most of these practices are going to stay. We have learnt from this experience, so I don't see us dropping our guards in terms of personal safety at any of our field locations.

> **"We should have discipline to improve planning so that all stick to their slots on the execution sequence and the whole collaborative framework works well."**

Bayo Ojulari's career in oil and gas began soon after he graduated from Ahmadu Bello University with a Mechanical Engineering degree, when he was hired by Elf Aquitaine as a process engineer. After moving to Shell Nigeria in 1991 as an associate production technologist, Ojulari has accrued experience in petroleum exploration, development and management across a number of regions including Europe, the Middle East and Africa. As a result of exemplary performance in several management roles within the company, Ojulari was named managing director for Shell Nigeria Exploration and Production Company, a position he has being holding for the past five years. Serving in this role, Ojulari administers the company's deep-water operations and has successfully led it to profitable horizons by increasing production and reducing operational costs. He is the former chairman of the Society of Petroleum Engineers (SPE Nigerian Council), remains a serving member of the Board of Trustees of SPE and is a fellow of the Nigeria Society of Engineers. During his professional career Ojulari has earned a number of awards for his company and for personal achievement including a Professional Award for the notable contribution to the development of Nigerian content in the oil and gas sector which was presented by the Petroleum Technology Association (PETAN).

HOT PIPELINE COATINGS FOR HOTTER OFFSHORE DRILLING

Balanced glass transition temperature, flexibility, barrier and damage resistance properties permit deeper extractions and efficient reel-lay applications, says Dr Jeffrey David Rogozinski, global product director – Fusion-Bonded Epoxy/Pipe, Sherwin-Williams Protective & Marine.

OFFSHORE OIL AND gas exploration is bringing new material compatibility challenges as producers drill increasingly deeper wells. With each kilometre of depth drilled, the extracted contents rise in temperature by around 25°C, forcing operators to reconsider some traditionally specified materials. That includes coatings applied to underwater pipelines to protect them from corrosion. Older coatings cannot handle the additional heat exposure.

Thankfully, higher extraction temperatures are not hindering exploration activities. Newer high operating temperature (HOT) fusion-bonded epoxy (FBE) coatings can now accommodate pipeline temperatures up to 180°C, with room to handle even higher temperatures in the future. These enhanced capabilities are made possible by balancing several interrelated performance properties, including:

- **Glass transition temperatures (Tg):** Pipelines operating above the Tg of their applied protective FBE coatings face significant risks. The coatings may become pliable and lose physical properties above their design temperature, making them susceptible to degradation, loss of adhesion, disbondment and ultimately premature failure. Today's HOT FBEs feature higher Tg values, making it easier for pipeline operators to specify coatings with transition temperatures that are at least 5-10°C above the highest anticipated operational temperature of the pipe. At this threshold, the coatings will remain hard and glasslike – in a continuous layer with better adhesion – for better performance.
- **Flexibility:** Increasing an FBE coating's Tg often requires sacrificing other properties such as flexibility. FBE flexibility is critical to enabling installation efficiencies and cost savings. Despite their higher Tg values, newer HOT FBE coatings maintain a high degree of flexibility, ensuring pipes can be "reel-laid." Installers can therefore prepare a kilometre of pipeline onshore, spool it and then reel-lay the pipe offshore. They can then connect another kilometre-long section to that pipe from a barge, coat the field joint and continue pipe laying. These activities are significantly more streamlined and less costly compared to welding and coating field joints every 12 metres from the barge.
- **Barrier properties:** Newer, HOT FBE technologies with higher Tg values are able to maintain tightly linked structures within the coating matrix. Therefore, a molecule will have a harder time working its way into and through the coating to reach the steel pipe substrate. The tighter the links, the better the barrier against water, electrolytes, oxygen and other moieties that contribute to corrosion.
- **Damage Resistance:** Increasing the Tg of an FBE can also alter the coating's damage resistance properties, as the more heat-resistant molecules can either provide better or worse resistance to impacts, gouges and abrasions. Newer HOT FBE coatings with higher Tg values ensure better damage resistance as the coatings remain somewhat flexible, while retaining a highly crosslinked structure due to molecular level composites. This flexibility allows the force of an impact to dissipate within the HOT FBE matrix instead of being relieved by forming a crack in the coating.


Image credit: Sherwin-Williams

Dr Jeffrey David Rogozinski, Sherwin-Williams Protective & Marine.

By balancing higher Tg values with better barrier properties and damage resistance, newer HOT FBEs are enabling offshore exploration into untapped areas, deeper well drilling and hotter material extractions. Their flexibility for reel-lay applications is also providing welcome efficiencies and cost reductions for operators.

Explore South Africa!

Petroleum Agency SA was established in 1999 by Ministerial directive and is mandated through the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) (MPRDA) together with the National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA).

These Acts provide for Petroleum Agency SA to evaluate and promote oil & gas potential exploration and production activities in South Africa, to regulate oil & gas exploration and production industry and to archive all geotechnical data produced through oil & gas exploration.

The Agency acts as an advisor to the government on issues regarding oil & gas exploration and production, and carries out special projects at the request of the Minister.

Our Vision

A diverse upstream industry contributing to energy security through sustainable growth in exploration and development of oil and gas.

Our Mission

To promote, facilitate and regulate exploration and sustainable development of oil and gas contributing to energy security in South Africa.

Petroleum Agency SA,
based in Bellville, Cape Town, is responsible for the promotion and regulation of exploration and exploitation of oil and gas (petroleum) resources.

Contact us to find out about:
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AUTOMATION MAKING MULTI-SECTOR APPEAL

Automation helps the oil and gas workforce to work faster and helps asset owners save time and money without compromising safety. Organisations are increasingly looking to deploy automation to improve their operational performance and make vital efficiency gains.

Image Credit: Emerson

Emerson's tank inventory software application aims to improves operational efficiency.

AUTOMATION OF ENERGY technology is important for mastering the future challenges of sustainable energy supply. It is already being established across oil and gas operations, and some of the latest technologies and collaborations are helping operators with highly specific tasks in sectors and subsectors.

For example, in a recent move to deploy workflow automation software that is specifically tailored to the requirement of the oil and gas industry, Petrofac has signed a three-year partnership with Intoware. The development of 'WorkfloPlus Oil and Gas' will further optimise the efficiencies that Petrofac has gained from digitalising maintenance and inspection activity for its clients. The software has been designed to automatically generate digital workflows, schedules and reports for users, eliminating the traditional manual and time-consuming preparation required.

Steve Johnson, vice-president of digital for Petrofac's Engineering and Production Services business, commented, "The tool empowers teams to work faster and more efficiently, ultimately saving asset owners time and money without comprising safety."

Honeywell technology plays a major role in providing automation solutions in large petrochemical complexes. In February 2021, in North Africa, Sidi Kerir Petrochemicals Company (SIDPEC) selected Honeywell technology to upgrade the production capabilities of its flagship petrochemical complex in Alexandria, which produces ethylene and polyethylene for the Egyptian market. Honeywell has replaced SIDPEC's legacy Honeywell TotalPlant Solution (TPS) production system with the latest version of its Experion Process Knowledge System solution at SIDPEC's complex in Alexandria.

Also, Anchorage Investments Ltd will use Honeywell UOP's C3 Oleflex technology to produce 750,000 mt per year of polymer-grade propylene for its new Anchor Benitoite petrochemicals complex in Suez, Egypt, near the southern terminus of the Suez Canal. Honeywell UOP's C3 Oleflex technology converts propane to propylene through catalytic dehydrogenation. The technology is designed to have a lower cash cost of production and higher return on investment when compared to competing dehydrogenation technologies.

It is not just all about the strategic collaborations – companies are developing sophisticated technologies too. The latest on the list is Emerson's Rosemount TankMaster Mobile – the world's first cross-platform inventory management software application for tank gauging systems – providing immediate secure access to critical tank data. By making real-time data available to a wider range of stakeholders via smartphones, tablets and computers, this easy-to-use mobile solution facilitates better decision-making and improved operational efficiency and safety.

Per Skogberg, solutions manager with Emerson's Automation Solutions business, said, "By facilitating secure mobile access to this information, Rosemount TankMaster Mobile provides the opportunity to increase efficiency, drive productivity and improve collaboration throughout the supply chain."

STAYING IN TOUCH AT SEA

For many years, leaving for missions on offshore structures was perceived as difficult, with workers staying months away from family and having limited means of communication on board. The offshore sector must now benefit from technologies for an optimised and advanced communication at sea. Tanguy MOREL, CEO and co-founder of Moment, describes.

THE DIGITAL TRANSFORMATION has revolutionised the way we work, the way industries operate, the way the supply chain is managed. A digital approach has undoubtedly become essential to optimise productivity and logistics. However, due to the harsh conditions of the seas and oceans, the offshore industry has not yet fully adopted the digital transformation, slowing down the development of the industry. To help with the digital transition, communication infrastructure could be, early on in the project, taken into account.

Offshore operators' strategies focus on portfolio expansion, oil exploration and increased production. Yet, the technological options have been limited to support the digital transformation of the industry. While satellite technology has been an important step towards further communications, enabling operators to move away from limited technologies such as morse code, VHF radio and cellular networks, it is an expensive technology, slower and with latency issues.

The necessity to find new effective communication solutions allowing the optimisation of production, enhancement of safety and increasing the well-being of workers is crucial to support the ambitions of the major operators present in Africa. The continent counts some of the most important producers such as Gabon. New high added value local and regional projects, such as in Côte d'Ivoire, Angola and Nigeria, and enhanced growth linked to the efforts of extractive companies to optimise mature fields, make Africa a strategic area that continues to attract operators and investors.

Image Credit: Moment

Tanguy MOREL is the CEO and co-founder of Moment.

The use of digital technology would enable improved performance, increased uptime, optimised production and enhanced safety onboard. With crew efficiency considered an essential vector to support operators' development, their onboard conditions must be reviewed in order to respond to their needs and enhance their wellbeing at sea. The fatigue, feelings of isolation and depression may have significant consequences on the mental and physical well-being of those workers who spend long periods at sea on platforms, vessels, surfers or drilling units. Improving the crew's wellbeing and their onboard living conditions with a reliable and flexible communication solution is no more an option but essential for the industry's sustainability. The past year has highlighted the need for the petroleum services industry to adapt in order to avoid social conflicts and strikes which can damage their image. Because of its essential role in keeping economies around the world running, the industry needs to find new tools that will help with workers' retention and enhance their wellbeing while working on a rig.

There is a growing demand for broadband connections and connectivity. Seafarers rely on connectivity to stay in touch with friends and family, check social media, send emails or consult a doctor. Equipped with smartphones or tablets, workers come onboard for several months and expect to have the same experience they can have "at home." Designed for an offline environment and based on a new generation wireless system, digital platforms generate a local Wi-Fi network accessible from personal electronic devices.

The deployment of this kind of service contributes to upgrading onboard accommodation and improving the lives of seafarers. For offshore operators, it is also a way to strengthen recruitment policies and establish a new environment onboard, an important detail as the sector seeks to gain more productivity.

BUILD BACK BETTER

SOLVING AFRICA'S ENERGY PROBLEMS

Speaking exclusively with *Oil Review Africa (ORA)*, Marly Diallo, founder of BRT Energy, venture partner at United Capital Group and ambassador for Meaningful Business, has shared insight on powering sustainable solutions to solve Africa's urgent energy problems.

ORA: Climate emergency and the pandemic aftershock – what are the opportunities coming out of the crisis?

Marly: Petrol stations in Africa are part of economic life. In addition to traditional services (gas, car repair, spare parts) there's an opportunity to manage the climate and pollution risk due to the non-proper disposal of vehicles' batteries (cars, trucks, buses etc). With the right training and strong engagement, oil companies have the opportunity to enable longer use of the batteries by the local population.

We had a discussion before the crisis with one network in Ghana which is interested in this initiative. The impact can be pretty large. We can reduce the global hazard due to bad battery recycling and push emerging countries to a more circular economy.

What does the pandemic teach the sector about managing climate risk in order to 'build back better'? Has the pandemic recalibrated the sector's risk radar?

Marly: The oil and gas industry has experienced a downturn due to the pandemic. According to the Wall Street Journal, spending on oil production worldwide isn't expected to climb back up to pre-pandemic levels through at least 2025. This global crisis has forced stakeholders to explore green alternatives to mitigate the risk. As a result of this, the industry is being recalibrated, with clean tech and renewable energy now priorities for many oil and gas companies.

Image Credit: BRT Energy

Marly Diallo is the founder of BRT Energy and ambassador for Meaningful Business.

> **"Building stronger cross-border collaboration and partnerships will help oil and gas companies become better prepared to face uncertainty and economic downturn."**

How can African operators respond to the oil and gas downturn?

Marly: The best way for African operators to respond to the downturn is accelerating the renewable energy investment trend instead of attempting to reverse it. By the end of this decade, non-fossil-fuel investments will make up two-thirds of energy spending. This market shift is an opportunity for African operators to partner with startups, innovators and visionary entrepreneurs to build new business models that are lean, agile, and directed towards the future.

How can regional collaboration contribute greater value to the continent's oil and gas boost? How are governments acting on this?

Marly: By enhancing and scaling their regional collaboration framework, oil and gas companies can tap into better resources such as on-the-ground experience, innovation-driven technology such as digitalisation and market expertise. Building stronger cross-border collaboration and partnerships will help oil and gas companies become better prepared to face uncertainty and economic downturn. The government also has an opportunity to accelerate regional collaboration by privatising national power companies.

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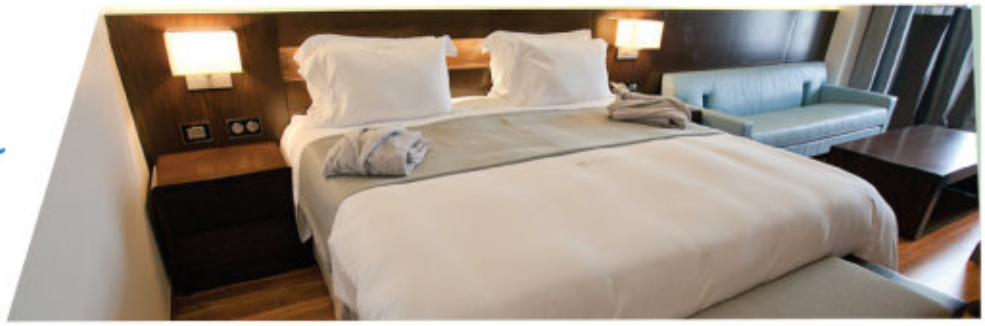

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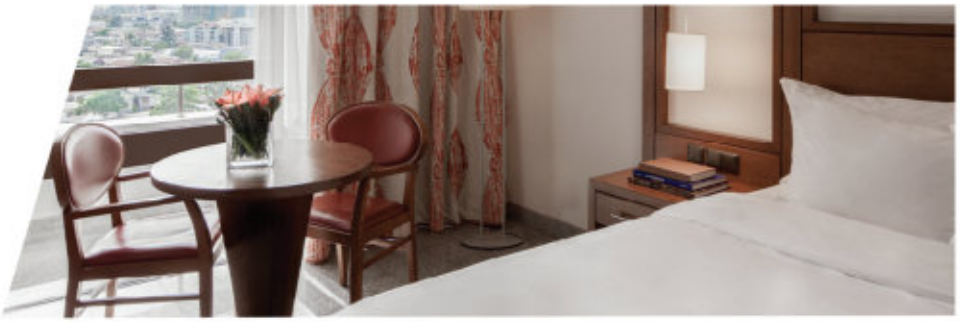

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THE GOOD COMPANIES ARE SOCIALLY RESPONSIBLE

Oil and gas companies in Africa are stepping up their commitment to corporate and social responsibility (CSR), providing opportunities for local firms and entrepreneurs. Martin Clark reports.

CORPORATE SOCIAL RESPONSIBILITY (CSR) initiatives are growing in Africa, but are not a new thing for the oil and gas industry.

Operators in Nigeria have long worked with local communities to further a huge number of CSR projects, from installing clean water taps outside compounds to erecting whole schools and even small power stations.

But it is a trend that is set to grow in the current climate, with big investment funds and financiers seeking hard evidence of a commitment to CSR and the broad umbrella of concerns it encompasses.

Shell's experiences in Nigeria over decades have given it unique insight into this area.

In its 2020 Sustainability Report, the company further highlighted its commitment to the area, which last year included a US$10mn pledge to Covax, the programme working for equitable access to Covid-19 vaccines in poorer countries.

In February 2021, its chief executive, Ben van Beurden, also unveiled a new initiative – Powering Progress – designed to further integrate sustainability with Shell's wider business strategy.

It lays out ideas on how the group can help as the world accelerates towards a future of zero- and lower-carbon energy –another growing feature of CSR work.

One of its goals, by 2030, is to provide electricity to 100mn consumers in emerging markets who do not yet have it.

Work is already well underway: last year, it completed minority investments in PowerGen, a company that develops, builds and operates mini-grids in Africa.

CSR is not just for the largest multinationals, however.

French independent, Perenco, which has production sites across Central Africa, has supported a whole roster of projects in the territories in which it operates.

Image Credit: Adobe Stock

The advancement of CSR initiatives across the energy sector will be good news for Africa.

These are focused on supporting societal, environmental and economic agendas, all geared to yield a positive development for local communities.

In Gabon, in the Moyen-Ogooué region, 160 km south-east of Libreville, the village of Batanga has benefited from electrical power facilities built by the company during its operations.

These supply more than 80 homes with electricity following the installation of buried cables connected to generators.

In the Democratic Republic of Congo (DRC), Perenco's power plant – fuelled by its own local gas production – supplies the National Water Company and a city network covering the needs of around 200,000 Muanda inhabitants.

Increasingly, as the expectations and demands placed upon oil companies shift, these responsibilities are likely to result in a swathe of partnership and development opportunities for communities and support services.

The advance of CSR initiatives across the energy sector will be good news for Africa.

SAIPEC 2021 highlights new-age trends in the oil and gas sector

THE RECENTLY CONCLUDED 5th edition of the Sub-Saharan Africa International Petroleum Exhibition and Conference (SAIPEC) – held virtually from 19-21 May 2021 with the theme, "Post-Covid-19 from Global Crises to Global Opportunity" – featured speakers from across the entire oil and gas value chain who gave their thoughts and solutions available for Africa's ever-evolving energy industry.

The participants were benefitted from the direct access to the primary stakeholders and key players in the African energy sector supply and value chains. Across three days, speakers and delegates had the opportunity to participate in business, technical and special focus sessions, providing critical insights into the region's hydrocarbon businesses.

This, coupled with excellent networking opportunities, allowed participants to engage with peers from local, regional and international businesses that want to develop business opportunities in a relaxed and friendly environment. The virtual international exhibition attracted an increasing number of specialised companies who showcased their latest products and services, including many international and regional energy companies and service providers, regional and national oil companies. SAIPEC 2021 attracted more than 6,000 visiting professionals from across sub-Saharan Africa, Europe, Americas and Asia.

The chairman of the Petroleum Technology Association of Nigeria (PETAN), Nicolas Odinuwe, urged governments to develop enabling environments to attract investments into the African oil and gas industry.

In a keynote address, Dr Timpre Sylva, minister of state for petroleum resources, Federal Republic of Nigeria, said that Nigeria still grapples with the effect of the Covid-19-driven crisis. However, there are rays of hope. "Life is generally returning to the new normal and evidently economic activities are picking up globally. This represents a fundamental opportunity for the oil and gas industry, because, with increased demand for crude oil, new investment can come on stream. Consequently, the post-Covid-19 world will continue to see the oil and gas industry accelerate its transition towards cleaner energy sources. Product and service delivery will have a paradigm shift from traditional business models."

"The future of survival and success of many players in the industry depends not only on their achieving greater focus on cleaner energy sources but also upon their ability to deliver lower cost solutions in traditional areas of crude oil and gas production," Sylva further added.

Speaking about the challenges and solutions in harmonising issues for Nigeria refineries, Emeka Ene, CEO of the Oildata Energy Group which includes ENPOWER Free Trade Zone company FZE, Oildata and Xenergi, stated, "We currently have the absence of a sustainable business model in terms of processing of the petroleum products, selling it at a competitive price and putting that money back into the growth of business. That has been really challenging because the Nigerian refinery sector has a lot of highly professional people who have not really been given the opportunity to demonstrate their capacity. Now, the government is creating a sustainable business model to ensure that the petroleum products are processed and sold at market prices."

A session on NOCs highlighted the opportunities as several new and existing energy countries offer their prospects. Another panel discussion outlined the dynamics' of sub-Saharan Africa's energy, oil and gas as the nations strive to a low carbon future. In a live Q&A with women energy leaders, the audience heard first-hand from female global energy leaders on the key to success, as well as discussing challenges faced and strategies to success in a male dominated industry.

Hungry for offshore energy content? OTC Houston is the platform

THE OFFSHORE TECHNOLOGY Conference (OTC), one of the leading platforms to share advanced scientific and technical knowledge for offshore resources and environmental matters, will be held from 16-19 August 2021 at the NRG Park, Houston, Texas, USA.

More than 350 peer-selected technical presentations will be leveraging 13 societies' collective knowledge and covering topics from the wellbore to topsides and everything in between. The event will provide an opportunity to connect with global C-suite leaders and more than 100 speakers to discover what innovations the industry can expect over the next 50 years.

Some of the conference sessions include:

Offshore Oil and Gas Industry Transformation and Smart Technologies: A New Era to Sustain Profitable Operations: The challenges associated with maintaining the lower cost regime that has emerged from the downturn in the deep-water industry has forced manufacturers and operators to work together for better solutions.

Materials and Technology Advancements for Deepwater and HPHT Environments: Materials innovations promise exciting new opportunities for progressing the technological frontiers critical for sustainable advancements, such as energy production, nanoelectronics, artificial intelligence, advanced environmental, among others.

Shaping a Low Carbon Future with Supplier Diversity: Supplier Diversity is the process of integrating diverse suppliers into the execution of corporate strategy. That is why corporations such as bp are coming together for a networking reception and panel discussion to showcase the importance of supplier diversity in offshore.

Spotlight on New Technology Award

The OTC announced the 2021 recipients of the Spotlight on New Technology Award, which recognises new, innovative technologies that are advancing and revolutionising the future of offshore energy. This year, 14 technologies from 13 companies around the world were selected, including five companies receiving small business recognition.

Winners are selected based on five criteria including the technology's novelty in the marketplace, innovation, demonstrated success, broad commercial appeal, and ability to make a significant impact across the offshore industry.

The spotlight winners include: Dril-Quip; Halliburton and TechnipFMC; Oil States Industries; Saipem; Schlumberger; Siemens Energy; Subsea 7 and autonomous Subsea 7 subsidiary Xodus Group.

As stated in the website, in response to the Covid-19 pandemic, OTC is dedicated to creating and maintaining a safe and healthy environment in compliance and following the guidance from federal, state and local governmental agencies and health authorities.

For further information, see the website at https://2021.otcnet.org

AFRICAN RIG COUNT

COUNTRY	March 2020	April 2020	March 2021	April 2021
ALGERIA	34	42	25	27
ANGOLA	6	7	4	4
CAMEROON	2	0	1	1
CHAD	7	7	3	3
CONGO	2	2	0	0
CÔTE D'IVOIRE	0	0	0	0
EQUATORIAL GUINEA	0	0	0	0
GHANA	2	1	0	1
KENYA	5	5	3	3
LIBYA	11	10	12	12
MAURITANIA	0	1	0	0
MOROCCO	0	0	0	0
MOZAMBIQUE	0	1	1	1
NIGERIA	21	16	6	5

Source: Baker Hughes

Halliburton introduces new Borehole Imaging Technology

HALLIBURTON COMPANY (NYSE: HAL) announced StrataXaminer, a new wireline logging service that helps operators acquire more accurate well data to better evaluate production potential. The tool delivers high-resolution images of the reservoir structure to identify bedding, fracture patterns, fault zones and potential flow barriers with increased accuracy.

Obtaining high-resolution images in oil or synthetic-based fluid systems has been an industry challenge for decades. StrataXaminer has ten different operating frequencies and customers can select any three frequencies to record simultaneously. This dynamic range allows operators to customize the image quality based on the formation type, fluid system, and record in a single pass.

Image Credit: Adobe Stock

With this technology, obtaining high-resolution images will be much easier now.

"Our team used StrataXaminer to target sedimentary features in tight sands to better understand our fracture network and maximize production," said a representative from Tarim Oil Company.

The tool is available in three versions to optimize the acquisition quality in various size boreholes and can operate in higher pressures than previous technologies. The 8-pad tool provides the greatest borehole coverage as it records data up and down a well, improving data quality and providing more acquisition options on a single run in hole.

www.halliburton.com

LR innovates lifecycle approach in oil and gas

LLOYD'S REGISTER, A professional services company specialising in engineering and technology solutions, is launching a suite of new modules and updates to its subsurface software packages, IC and IP.

The software's capabilities aim to capture and utilise data throughout the lifecycle of wells and fields, allowing operators to rise to the challenges presented by a maturing industry and the energy transition without additional software investment at each stage. The new modules and software updates will be demonstrated at the virtual SPWLA 62nd Annual Symposium 2021 from 17-21 May.

Derek Crombie, vice-president of subsurface at Lloyd's Register, said, "Integrated digital technologies are vital for subsurface operators to keep pace with, and push the boundaries of, a rapidly changing world."

"With countries such as Denmark no longer issuing new hydrocarbon exploration licenses, E&P operators are increasingly seeking to maximise output from their existing assets and regions."

One of the new modules, Casing Inspection, will seamlessly integrate mature well monitoring and abandonment into the platform, strengthen IP's existing collection of cased-hole tools, further improving insights across a well's lifecycle. Two further modules will provide automated workflow benefits for users.

Hytera's solution helps African firms improve productivity

HYTERA, A LEADING global provider of professional and private communication network, has a comprehensive understanding of the communication challenges the industrial users are facing in public safety, energy, transportation, utilities, commercial and other industry verticals.

In Africa, it has leveraged its expertise to help oil and gas companies improve productivity, while reducing cost through digitalisation and informatisation.

Having been active in the Africa market for more than a decade, Hytera has served clients such as Addis Ababa Police Commission, South Africa Benoni Community Policing Forum, South African Airways, Ghana Tema Port, Anglo Gold Ashanti, Congo SONAREP Oil and Gas Company, South Africa Petro-chemical Industry Sasol, and Burkina Faso Nantou Zinc Mine, bringing world-leading technology to diversified industries like municipal sectors, railway, oil and gas, harbours and business.

For oil and gas companies, Hytera provides tailored solutions that meet diverse operational requirements, ranging from the exploration, production and storage of oil, right through to the transportation, refining, and trading processes.

Honeywell UOP C3 Oleflex technology to be used for Anchorage Investment's new project

HONEYWELL UOP's C3 Oleflex technology will be used to produce 750,000 mt of polymer-grade propylene per year for Anchorage Investments Ltd's new Anchor Benitoite petrochemicals complex in Suez, Egypt.

Propylene is the primary component in a variety of plastic products, which Honeywell's UOP C3 Oleflex technology converts from propane through the catalytic dehydrogenation technology.

As part of the contract, Honeywell will provide technology licensing and basic engineering design, in addition to services, equipment, catalysts and adsorbents for the plant. This is Honeywell UOP's third award for a C3 Oleflex unit in North Africa, following earlier wins in Egypt and Algeria.

Honeywell's UOP C3 Oleflex technology is cost-efficient and consumes less energy. The platinum-alumina-based catalyst system minimises the adverse effects on the environment. The independent reactor and regeneration design of the Oleflex technology helps increase operational flexibility and onstream reliability.

Image Credit: Honeywell

Honeywell will provide technology licensing and basic engineering design, as well as services, equipment, catalysts and adsorbents for Anchor Benitoite petrochemicals complex in Suez, Egypt.

"The increasing consumption of plastics in the region has created a growing gap between supply and demand for propylene, which has historically been a byproduct of refining fuels," said Laura Leonard, vice-president and general manager, Honeywell UOP Process Technologies.

SILIXA wins the Queen's Award for Enterprise: Innovation 2021 for Carina Sensing System

SILIXA LTD, A company that specialises in fibre-powered data solutions, has won the Queen's Award for Enterprise: Innovation 2021 for its ground breaking Carina Sensing System.

The system takes the high-density coverage of distributed sensors beyond the capability of other point sensors. This allows actionable insight for refining the existing processes and developing new applications that improve sustainability, reduce costs and enhance operational safety.

Glynn Williams, CEO, Silixa, said, "With the launch of the Carina Sensing System in 2019, we doubled down on our diversification strategy, entering underserved sectors that required accurate monitoring solutions. The remarkable growth resulting from this strategy reflects the benefits that the technology delivers in onshore conventional and unconventional operations and sub-sea oil and gas wells."

Cost reduction is most prominent in permanent seismic applications. In marine seismic applications, the reduction in costs can exceed USD$10's of millions over the life of a field. In an in-well application, the permanently installed fibre optic monitoring system gives access to actionable information throughout the life of an asset.

Image Credit: Adobe Stock

The cost reduction brought about by Carina Sensing System is most prominent in permanent seismic applications.

Subsea 7 and Xodus' sensor platform awarded at OTC '21

SUBSEA 7, A COMPANY that specialises in the delivery of offshore projects and services, and its autonomous subsidiary, the Xodus Group, has been bestowed with the 'Spotlight on New Technology Award' for the Subsea 7 Nano Enginneered Sensor Platform (Subsea 7 NESP) at the 2021 Offshore Technology Conference (OTC) in Houston.

The advanced sensor platform was selected based on its broad appeal to the energy industry, and significant impact as well as benefits.

Subsea 7 NESP, developed in collaboration with Xodus, is a transformative solution that can continuously monitor fatigue and corrosion offshore, reducing OPEX in these areas. The wireless nano-technology sensor can be deployed efficiently and easily across any operating asset. It requires no power supply or batteries and offers a scalable, cost-effective, zero-maintenance solution to extend asset life and improve uptime.

Steve Wisely, senior vice president of Subsea 7's UK and Global IRM region, said, "The Offshore Technology Conference's Spotlight on New Technology Award highlights the global innovations that are leading the transformation of the energy industry, and we are proud to be recognised for that."

"We see Subsea 7 NESP as a promising step towards our key strategic priorities of environmental sustainability and operational efficiencies and we believe it can have a significant impact on the wider industry," added Steve.

Extend your possibilities with Sanicro 825 hollow bar

SANDVIK, A DEVELOPER and producer of advanced stainless steels, special alloys, titanium and other high-performance materials, has launched Sanicro 825, Sandvik's first-ever nickel-iron-chromium alloy in bar and hollow bar, for improved performance in corrosive, high-temperature environments.

Sanicro 825 (UNS NO8825) extends the company's growing Sanicro portfolio of nickel alloys and austenitic stainless steels for aggressive wet, corrosive and high-temperature, pressure, acidic and seawater conditions.

A high-strength alloy with minimum 40% nickel content, Sanicro 825 has corrosion resistance to acids and alkalis, superior resistance to stress corrosion cracking (SCC) and corrosion resistance to phosphoric, nitric, sulfuric, and organic acids, seawater, caustic chloride alkalis and ammoniac media. Stable, easy to machine and weld, the new alloy is ideal for use in a wide range of components and installations including heat exchangers, evaporators, offshore piping systems, seawater coolant, valves and flanges. It serves a multitude of industries including oil and gas, chemical, petrochemical, pulp and paper, pickling equipment, nuclear fuel processing and food processing.

Available in three- to seven-metre lengths with an outside diameter (OD) from 20mm-260mm, Sanicro 825 offers a cost-effective alternative to superalloys, such as Alloy 625. Its chemical formulation has been tailored to different standards.

Image Credit: Sandvik

Sanicro 825, the company's first-ever nickel-iron-chromium alloy in bar and hollow bar.

ADVERTISER'S INDEX

THE ROLE OF NOCS IN THE ROAD TO NET ZERO

Liam Yates (senior analyst, Middle East upstream) and Kristina Beadle (analyst, carbon research) at energy consultants Wood Mackenzie discuss whether NOCs will follow the lead of the majors in setting ambitious emissions reduction targets.

NOCS DOMINATE THE global oil and gas space – producing 50% of liquids and 48% of gas in 2021. And as some IOCs diversify away from oil and gas as part of their energy transition strategies, this is only likely to increase.

But high levels of production result in high absolute greenhouse gas emissions from upstream activities. Of the almost 100 companies included in our Emissions Benchmarking Tool, NOCs account for nearly half of the top 20 upstream emitters (scope 1 and 2) in 2021, and take the top two spots.

The primary role of many NOCs is to generate revenue and maximise resource extraction for oil- and gas-rich government shareholders – and they often have access to some of the best quality and lowest cost resources. And some governments are reliant on oil revenues for over 90% of government income. So, efforts to reduce emissions, or carbon taxing, are a significant threat.

Despite high absolute emissions, the 11 NOCs covered in our Emissions Benchmarking Tool fare better on an emission intensity basis. Those with large, long-life conventional portfolios, such as Saudi Aramco and Rosneft, have lower corporate upstream emission intensities than many of their peers, while those heavily weighted to LNG have a high scope 1 and 2 emission intensity

The trend for carbon policy (such as carbon taxes) and emissions reduction targets is growing. But the risk to many NOCs is low, at least for domestic operations, with most governments unlikely to inflict carbon policy that will have an impact on domestic hydrocarbon revenues. However, there is growing global pressure for all countries to set emission reduction targets and policy, which may affect imported products as well as domestically produced products. There is also mounting pressure from investors for companies to reduce operational emissions.

High production and absolute emissions expose NOCs to more absolute value at risk if carbon taxes are implemented, although generally lower emissions intensity and high free cashflow means many NOCs could tolerate extremely high carbon taxes. Of the 11 NOCs analysed, the average carbon tax for upstream company cashflows to break even at a 10% discount rate is over US$400/tonne.

> **“2021 could be a pivotal year, with COP26 in Glasgow in November tipping the balance towards the adoption of further emissions reductions targets.”**

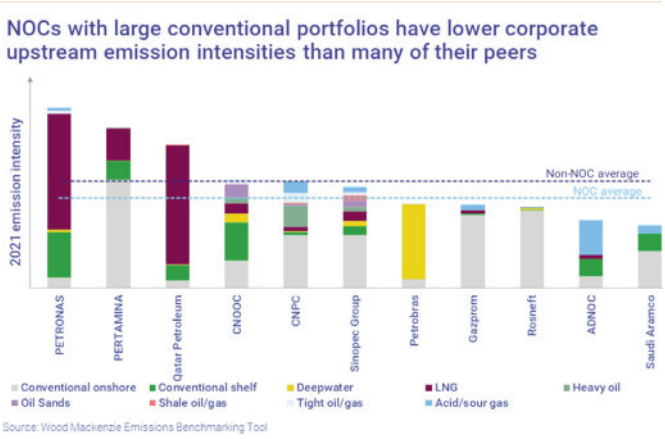

Image Credit: Wood Mackenzie

The NOCs are behind the curve when it comes to emissions reduction targets, with only three having set net zero ambitions: PetroChina, PETRONAS and Sinopec. Many have less ambitious, short-term targets and a handful, including Saudi Aramco and Gazprom, are yet to set any corporate targets. Several NOCs have ambitious production growth targets which will make any absolute emissions reductions challenging.

Last year saw a shift in focus for the European Majors, with all announcing targets to strive for ambitious Scope 1 and 2 emissions reduction targets and carbon neutrality by 2050.

So, are NOCs next? Increasing stakeholder and investor pressure, the growing marketability of low-carbon products and the physical impacts of climate change are all motivating forces.

And emissions reduction could evolve into lucrative business opportunities, with many of the NOCs already well placed to take advantage. So-called “green LNG”, carbon capture utilisation and storage, as well as more low-hanging fruit such as reducing flaring and fugitive emissions are all under active consideration by several NOCs.

The year 2021 could be a pivotal year, with COP26 in Glasgow in November tipping the balance towards the adoption of further emissions reductions targets. Setting a net zero target may not be achievable or desirable for all NOCs, but those with first mover advantage may reap the rewards of sustainability.

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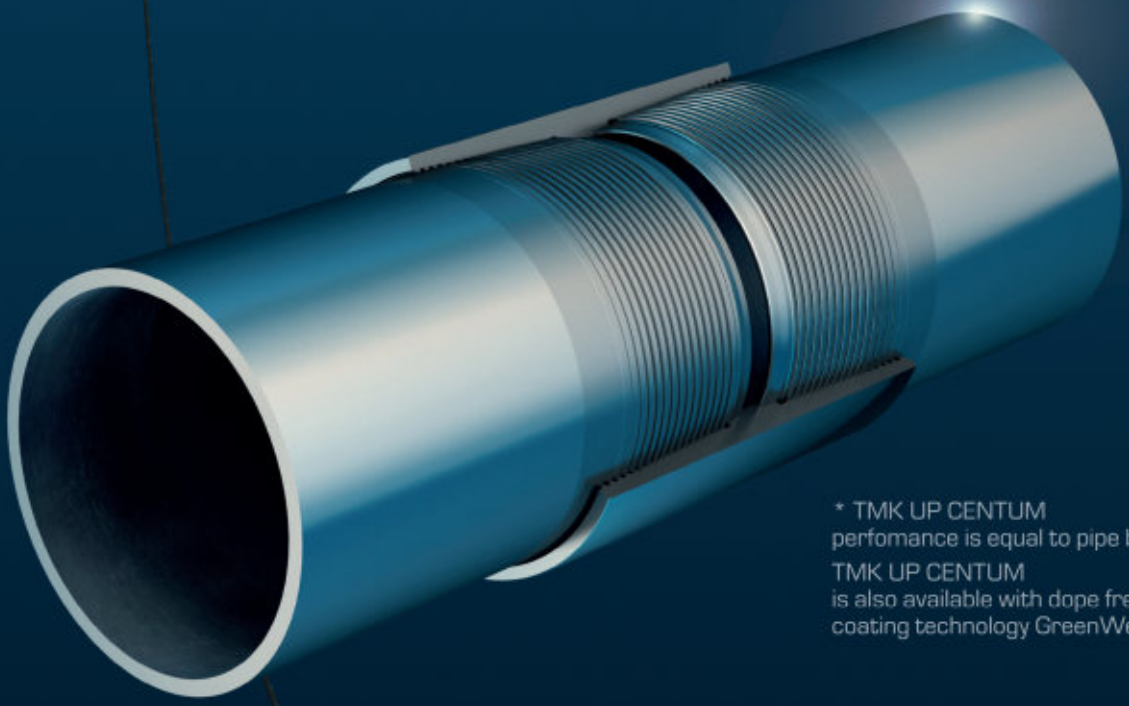

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