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Oil Review Africa

Oil · Gas · Petrochemicals

VOLUME 15 | ISSUE 6 2020

Namibia
fresh momentum in promising hotspots

Analysis: Kenya aims to revive affordable cooking gas programme (p34)

Country update: Gas is becoming the fuel of choice in Ghana

Event review: ADIPEC 2020

Oil spill, on-site power, well control, decommissioning, EPC, drilling and completion

Saga PCE

Primary Cementing Equipment
Liner Hanger Equipment & Services
Inflatable Packers
Well Testing Services
Saga-Lancaster Chokes

Compact, Robust and Reliable Production Chokes from SAGA-Lancaster

Production chokes play a critical role in the safe and economical delivery of the worlds oil and gas reserves. The demands of modern-day oilfield production dictate that safety and reliability is paramount.

For over 20 years, SAGA-Lancaster Flow Automation have designed and manufactured a high-performance production choke, specifically engineered to process aggressive fluids composed of sand and other solid particles.

Our engineering and manufacturing processes are characterized by our commitment to innovation. Our testing and research produce important information, but our best feedback comes from our customers.

The advances in our production chokes reflect the need to accommodate increasing operating pressures while delivering outstanding efficiency and reliability.

We've designed a long list of important advances in our chokes. For example, our equipment requires extremely low operating torque; our stainless operating lever is only 7.5 inches long. There's no need for large hand wheels or additional personnel.

Automation is really simple with a lightweight, low-powered actuator that can be installed while the choke is in service. Any type or brand of actuator is compatible, regardless of the trim type.

A tungsten-carbide trim is standard, however we offer multiple trim types with a single configuration bonnet and body. All seat assemblies utilize a non-threaded design that cannot be loosened from flow-induced vibration; which means there are no seat-to-body seal failures and body damage.

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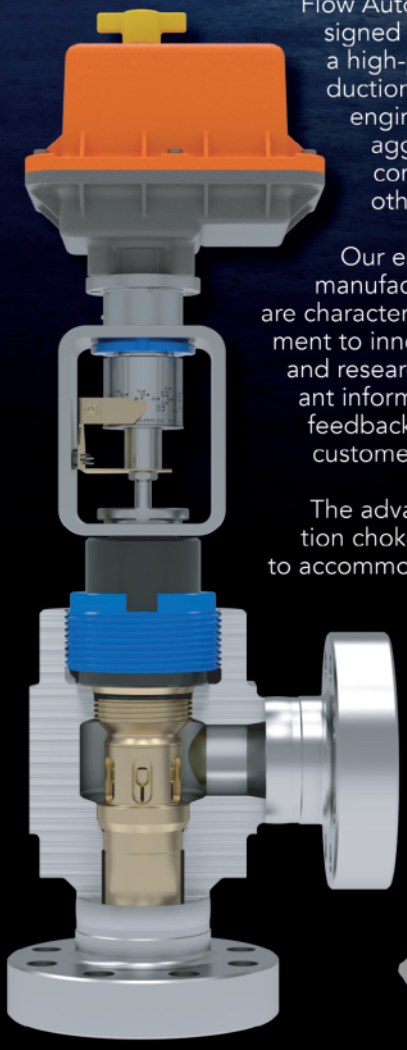
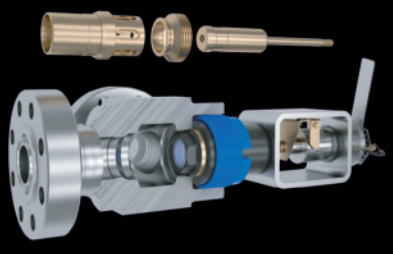
SAGA-Lancaster has manufacturing facilities in Houston, Texas and Samarinda, Indonesia. And, we have a service facility in Abu Dhabi in the UAE.





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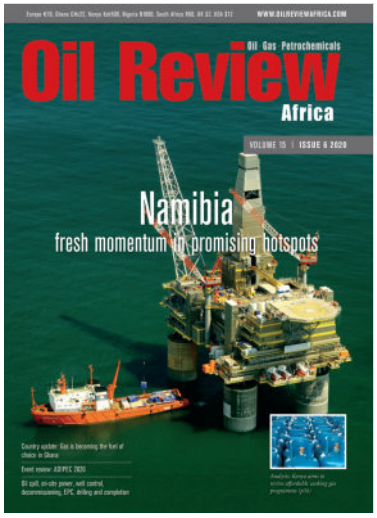

Namibia boasts proven basins and active petroleum systems. See p13. Image credit: Pixabay

EDITOR'S NOTE

IN THIS ISSUE, we explore a wide range of promising areas. From Ghana to Namibia, and other places in between, the map of Africa is shimmering with new "game changing" prospects, with fresh momentum and promises of exciting oil and gas discoveries in the very near future.

Our cover story takes a forensic look at the prospects and possibilities in Namibia, (page 13), which is enticing attention from oil majors, independents and juniors. The country's offshore basins are believed to be hydrocarbon-rich, with a number of prospects still need to be tested. Moin Siddiqi, our resident economist, analyses these prospects, which have led to an influx of other companies farming into exploration acreage. At the same time, our analysis on Ghana, (page 11), highlights the opportunities and challenges on the road to 2030.

Moreover, we have an interesting geoscience feature on reservoirs. Turn to page 23 to find out what E&P firms need to address when considering reservoir interpretation solutions.

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CONTENTS

NEWS

COUNTRY FOCUS

TECHNOLOGY & OPERATIONS

ANALYSIS

Executives' Calendar 2021

JANUARY

20-21 **Oil and Gas IoT Summit**
Lisbon, Portugal
www.oilandgas-iot.com

FEBRUARY

23-25 **SECURA North Africa**
Algiers, Algeria
www.securanorthafrica.com/en

MARCH

3-5 **SAIPEC**
Lagos, Nigeria
www.saipec-event.com

8-9 **Mozambique Gas & Power 2021**
Maputo, Mozambique
www.africaoilandpower.com/event/mozambique-gas-power-2021/

8-12 **SPE/IADC Virtual International Drilling Conference and Exhibition**
Virtual event
www.drillingconference.org/international

15-18 **NAPEC 2021**
Oran, Algeria
www.napec-dz.com

24-26 **6th POWER & ENERGY TANZANIA 2021**
Dar-es-Salaam, Tanzania
www.expogr.com/tanzania/powerenergy

JUNE

15-16 **Angola Oil & Gas 2021**
Luanda, Angola
www.africaoilandpower.com/event/angola-oil-gas-2021/

29-30 **South Sudan Oil & Power 2021**
Juba, South Sudan
www.africaoilandpower.com/event/ssop-2021/

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

Africa Oil & Power welcomes investors to energy event in 2021

AFRICA OIL AND Power (AOP) is set to mobilise the pan-African investment community ahead of its fifth annual AOP 2021 Conference & Exhibition, which unites key stakeholders across oil, gas, power and downstream industries to bring in a new era of African energy growth.

Under the theme "Invest Without Boundaries", AOP 2021 represents the premier platform for accessing the entire African energy value chain and fostering dialogue on bankable investment opportunities, the energy transition, industrialisation, regional business and economic transformation across the continent. As nations and investors gear up for the implementation of the African Continental Free Trade Area, which will be implemented on 1 January, 2021, AOP will promote investment across African and international borders, and a strong post-COVID-19 economic recovery based on sustainable energy development.

Image Credit: Africa Oil & Power Conference

Gwede Mantashe, Minister of Mineral Resources and Energy, South Africa.

Endorsed by and in partnership with the African Energy Chamber and South Africa's Department of Mineral Resources and Energy, AOP 2021 tackles dynamic challenges facing the African investment community, as the continent progresses towards post-COVID-19 growth.

The three-day event also leverages strategic partnerships with the South Africa Oil & Gas Alliance (SAOGA), South Africa-China Economic and Trade Association (SACETA) and South African Chamber of Commerce and Industry, putting the spotlight on opportunities in South Africa, Mozambique, Angola and the region.

"South Africa has an amazing industry that is already focused on and active in Southern Africa," said Adrian Strydom, CEO, SAOGA. "We welcome foreign partnerships and would like to encourage investment into South Africa, as this is an emerging industry with a lot of opportunities. Come and experience South Africa and its possibilities at AOP 2021, at which many of our members will attend the rich programmes."

For the first time, AOP 2021 will incorporate virtual formats alongside the in-person conference, as well as co-host collaborative events on the main stage – including the Africa Renewables Forum, Africa LNG Forum and Energy Finance Forum – in line with pan-African objectives to catalyse financing into natural gas exploration and monetisation, as well as facilitating a clean energy transition.

OPEC+ agrees to increase output after tense negotiations

TENSE NEGOTIATIONS AND rumours of a rift between Saudi Arabia and the UAE ended with a compromise deal for OPEC+ on 3 December 2020.

Despite concerns on oversupply for Q1 2021, the group agreed to increase output by 500,000 bpd in January. Production restraint is set at minus 7.2mn bpd instead of the Q4 2020 level of minus 7.7mn bpd.

Wood Mackenzie vice president Ann-Louise Hittle said, "After the initial OPEC session on 30 November, without its non-OPEC partners, signs of discord pointed to doom for the concept of a simple rollover of current levels of production restraint of 7.7 mn bpd. Under the April OPEC+ agreement, that restraint was due to ease to a 5.8mn bpd cut on 1 January 2021.

"During November, the idea of delaying that easing in production restraint took hold. This reflected widespread concerns that weaker-than-expected global demand would lead to a large oversupply in the first quarter, unless OPEC+ held back from the nearly two mmbbl per day planned increase."

The OPEC+ Joint Ministerial Monitoring Committee (JMMC) will meet in January to consider if the 500,000 bpd cut in restraint should be continued for February, or possibly doubled.

Hittle added, "This week's compromise reflects a determination to avoid a repeat of the price war in March and April this year."

African Energy Chamber to push for natural gas adoption in Mozambique

THE AFRICAN ENERGY Chamber has made a working visit to Mozambique to meet the country's government authorities, representatives of the oil sector and local entrepreneurs and services providers.

The chamber will be advocating for sound local content policies and development and a broader push for gas monetisation in order to fight energy poverty and create jobs.

With the revised development plan for the Temane PSA now approved, and as Eni's 3.4 mtpa Coral South FLNG and Total's 12.88 mtpa Mozambique LNG projects move forward, Mozambique is set to become an African gas leader. While Mozambican gas exports are expected to benefit more than just South Africa moving forward, the monetisation of its gas at home is also set to unlock tremendous local value for Mozambicans.

Image Credit: Adobe Stock

Mozambique is set to become an African gas leader in the near future.

The chamber continues to firmly believe that gas monetisation stands to change the economic outlook of Mozambique and its people. Natural gas remains the best hope the country has to fight energy poverty, improve security and offer opportunities to young Mozambican women and men.

West Africa oil and gas midstream market to register 1.54% growth

THE WEST AFRICA oil and gas midstream market is expected to register a CAGR of more than 1.54% from 2020-2025, according to ResearchAndMarkets.

Factors such as increasing investment in the sector and increasing production and consumption of oil and gas, are expected to boost the demand for the West African oil and gas midstream market during the forecast period. However, political instability in certain countries is expected to impede growth in the region.

Image Credit: Adobe Stock

In West Africa, Nigeria has relatively better midstream infrastructure than the other countries.

Increasing consumption in the region is expected to increase the growth in the sector with new pipelines and LNG terminals being expected to be constructed over the forecast period.

Exploration and production of oil and gas fields in the region are expected to become an opportunity for the companies working in the oil and gas midstream industry as more pipeline and storage infrastructure may be required.

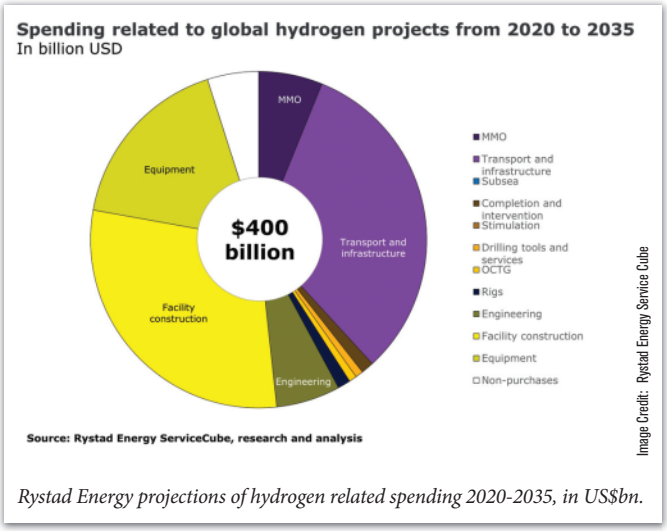
Nigeria, which produces most oil and gas in the region, has relatively better midstream infrastructure than the other countries. Massive investment in pipelines and LNG terminals is expected to increase the growth in the industry.

Future hydrogen projects could unlock US$400bn of spending for service industry

RYSTAD ENERGY INDUSTRY analysis reveals that green and blue hydrogen projects that are poised to be developed could unlock US$400bn worth of spending for the service industry between 2020 and 2035.

Of the total pipeline, Rystad Energy has recently projected that around 30GW of green hydrogen capacity is expected to be operational by 2035. Blue hydrogen initiatives are also growing in popularity, with several mega-projects being discussed at present. For all of these planned projects to be realised, substantial investments would need to be made over the next few years.

For the projected development that Rystad Energy expects through 2035, as much as US$400bn worth of investments would need to be deployed into the hydrogen market globally. The figure excludes separate carbon capture and storage (CCS) development contracts, which could reach US$35bn for Europe alone. Transport and infrastructure will take the largest share, as this market segment is forecast to reach an attractive total of US$130bn.



Rystad Energy projections of hydrogen related spending 2020-2035, in US$bn.

Facility construction costs are next on the list, with suppliers targeting an estimated US$120bn. Equipment costs will reach some US$70bn, while engineering costs and maintenance, modifications and operations (MMO) will amount to around US$25bn each. All other categories of costs are calculated at below US$10bn per segment.

Eco Atlantic re-issues all Namibia offshore licenses

ECO (ATLANTIC) OIL & Gas Ltd has successfully negotiated the reissuance of its four licences in the Walvis Basin, Offshore Namibia conditional to customary final government signature.

The company has agreed terms and conditions and been awarded the four new Petroleum Exploration Licenses (PELs) on its existing offshore blocks, leading to the expansion of its acreage position.

Eco has negotiated the reissuance and establishment of a new 10-year life cycle for each of the four PEL's. Each license has a participation of a standard 10% working interest (WI) with NAMCOR. Eco has also negotiated and established a 5% WI with local Namibian business partners on each block. Azinam Group also participates in a minority capacity on the Cooper, Sharon and Guy Blocks.


Image Credit: Adobe Stock

Eco has negotiated the reissuance and establishment of a new 10-year life cycle for each of the four PELs.

With the establishment of the new PELs, the company has doubled the size of its Guy block acreage, increasing the potential for new prospective targets in the deeper horizon to the west of the block. The new PELs cover approximately 28,593 sq km, with more than 2.362bn boe of prospective P50 resources.

Siemens, ProFlex partner on pipeline leak detection

SIEMENS ENERGY HAS collaborated with Houston-based ProFlex Technologies to provide spontaneous leak detection services for pipeline operators.

As part of the agreement, Siemens Energy has exclusive access to ProFlex Technologies' digital Pipe-Safe advanced leak detection technology.

The technology combined with Siemens Energy's Internet of Things (IoT) system will enable operators to reduce the environmental risk associated with the operation of their infrastructure by minimising unplanned releases of the product to the ecosystem.

The solution leverages remote pressure monitoring and complex data processing algorithms to rapidly detect and localise pipeline leaks within +/-20 feet of their location. It is particularly relevant for companies that operate aging infrastructure, enabling detection of small leaks in pressurised lines transporting virtually any type of liquid or gas medium (e.g., natural gas, crude oil, water, petrochemicals, etc.).

Specific applications include long-distance oil and gas transmission lines (such as multi-node systems); production gathering networks at well sites; and offshore production risers.

The pressure pulses generated by the leak are identified, and the location of the leak can be precisely determined. These data can be transmitted to mobile devices or back to a central location using the latest cloud-based technology. Immediate action may be taken to repair the leak.

Global oil and gas contract activity shows marginal increase in Q3 2020

A GLOBALDATA STUDY shows an almost 3% increase in the number of oil and gas contracts between Q2 and Q3, 2020.

Despite challenges including crude oil process and COVID-19's wide impact globally, 1,136 contracts were recorded in Q3, up from 1,104 in Q2. The total contract value of Q3's contracts reached US$14.16bn.

The key Q3 contract was JGC's EPCC work for the 34,500 bpd FCC unit, 55,000 bpd VDU unit and 40,000 bpd diesel desulfurisation unit for the Basra refinery project in Iraq.

GlobalData's new report 'Global Oil and Gas Industry Contracts Review, Q3 2020', states the upstream sector reported 758 contracts in the latest quarter, with the midstream and downstream/petrochemical sector reaching 205 and 183 contracts, respectively, during the quarter.

Europe recorded the highest number of contracts, with 495, followed by Asia, with 240, and North America, with 215.

Operation and Maintenance represented half of all contracts in Q3, followed by multiple-scope contracts such as construction, design and engineering, and installation. O&M and procurement accounted for 15%.

Additionally, according to a Rystad Energy report, the investments from global exploration and production companies (E&P) in 2021 are projected to reach around US$380bn, almost flat year-over-year.

VAALCO acquires additional working interest in Etame Marin Block offshore Gabon

VAALCO ENERGY HAS signed a sale and purchase agreement to acquire the 27.8% working interest of Sasol Gabon S.A. in the Etame Marin offshore block of Gabon.

As VAALCO currently owns and operates a 31.1% working interest in Etame, the transaction will nearly double the total production and reserves of VAALCO. In addition, VAALCO is acquiring 40% of Sasol's non-operated participating interest in offshore Gabon Block DE-8.

Cary Bounds, CEO, commented, "We believe that the acquisition of Sasol's interest at Etame is a very attractive and value accretive strategic acquisition for the company that confirms our position as one of the leading independent exploration and production companies in West Africa. In what was a competitive sales process, this is the ideal growth transaction that we have been seeking for VAALCO.

Image Credit: C Morrison/Pixabay

The acquisition is expected to deliver a step-change in production to more than 9,000 barrels of oil per day.

"We believe the acquisition of an additional stake in this field that we know so well, having been the operator since 1995, is an important step in implementing our strategy. The acquisition is expected to deliver a step-change in our production to more than 9,000 barrels of oil per day net based on current production, and significantly boosts our cash flow profile. With minimal additions to our overhead costs, we expect this transaction to lower our G&A cost per barrel by approximately 40%."

Westwood study shows massive stalled oil and gas resources

A NEW WESTWOOD study has shown a potential US$65bn worth of stalled oil and gas resources globally, with the largest volume of stalled gas found in the Ruvuma-Rufiji basin of Mozambique and Tanzania.

This oil and gas, potentially worth more than US$65bn and costing an estimated US$24bn to discover, represents 40% of the volume found in high impact discoveries in the period. The study shows where these resources are located, why are they stranded and how big an opportunity they represent.

Westwood has identified 26 different contributing factors. Above ground factors dominate, with the fiscal regime/gas terms in the host country, access to finance and portfolio prioritisation being the most common. Subsurface factors include fluid composition, and reservoir quality and compartmentalisation.

In Tanzania for example, 14 deep-water gas discoveries clustered in five potential developments are stalled due to a combination of above ground and subsurface issues. The above ground issues are mainly related to protracted negotiations with the Tanzanian government on gas terms. Reservoirs are more compartmentalised than in neighbouring Mozambique, with lower resource densities and higher development costs.

Image Credit: Westwood Global Energy

Graeme Bagley is the head of global exploration and appraisal.

In Angola's Kwanza basin, seven pre-salt discoveries are stalled due to a combination of above ground and subsurface issues.

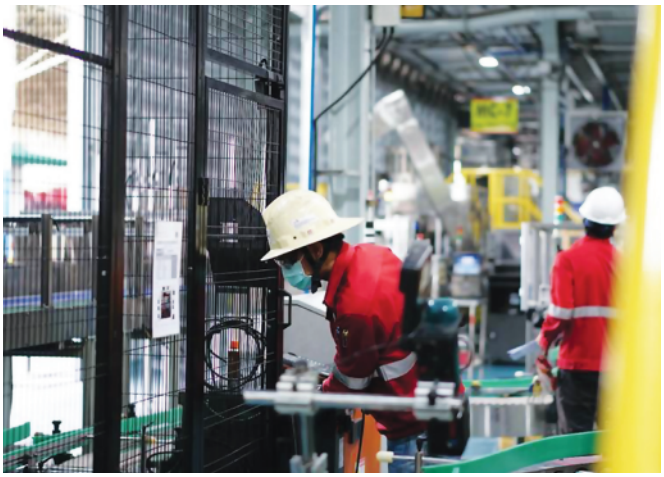
Shell entrusts SPIE with an enlarged lube oil facility contract in Bangkok

THE SHELL COMPANY of Thailand has awarded a new and enlarged contract to SPIE Oil & Gas Services, a subsidiary of SPIE, the independent European leader in multi-technical services in the areas of energy and communications, to provide corrective maintenance services at its lube oil facility in Bangkok.

This contract award comes after Shell renewed its preventive maintenance contract with SPIE on the same lube oil facility, in June 2020. These two contracts demonstrate SPIE Oil & Gas Services' ability to deliver high-quality midstream services – an expertise that had been developed for the first time in Thailand and specifically for Shell's lube oil facility in Bangkok.

The five-year corrective maintenance contract, which has been effective since July 2020, includes the provision of maintenance and repairs for all mechanical and electronical instruments at the lube oil blending facility in Bangkok. The equipment concerned are tanks, pumps, conveyers, valves, safety systems and industrial printers. To maintain the facility's productivity at its highest and avoid shortfalls of lube oil, corrective maintenance must be quick, efficient, and carefully scheduled.

Image Credit: Pornprapa Jeatsadanuk/ SPIE



SPIE Oil & Gas Services aims to broaden opportunities in South East Asia.

CNX Resources and PDC Energy install VAtitan-TC connection

CNX RESOURCES AND PDC Energy have installed the VAtitan-TC connection from voestalpine Tubulars, one of the leading providers of full welding solutions.

CNX Resources has installed 27,361 feet of VAtitan-TC on the Maj-12 pad in the Pennsylvania Utica Shale.

"The VAtitan-TC connection was very easy to make up at the rig site. The robust thread design and deep stabbing feature made for quick make ups, ensuring a smooth and efficient casing run," said Luke Beebe, vice-president of drilling, CNX Resources.

PDC Energy has installed 22,248 feet of VAtitan-TC in the Ferguson 23G-202 well located in the Wattenberg Field in the Denver-Julesburg Basin.

Image Credit: voestalpine Tubulars

CNX Resources has installed 27,361 feet of VAtitan-TC on the Maj-12 pad in the Pennsylvania Utica Shale.

"voestalpine Tubulars and PDC have been long-time business partners for Premier Pipe, and the VAtitan connection is just another example of the responsiveness of voestalpine Tubulars to address the challenges PDC faces in the field. Whether the issue is a demand for gas tight connections, or in this application, a need for the highest torque rating in the industry, voestalpine Tubulars has shown to be up to the task," stated Randall Edwards, president and CEO of Premier Pipe.

Other E&P companies are also utilising the VAtitan-TC connection in their extended reach wells, with material en route to well sites throughout the North American shale plays.

LANXESS awards Vysus Group framework agreement

VYSUS GROUP (FORMERLY LR Energy), in partnership with its previous parent company Lloyd's Register (LR), has secured a global framework agreement with specialty chemicals company LANXESS to drive improvements in maintenance and asset integrity across its global operations assets.

The global framework agreement, which is valid until the end of 2021, will see Vysus Group deliver equipment integrity consulting services to LANXESS, utilising LR's AllAssets software in order to support LANXESS mechanical integrity programme.

With the agreement, LANXESS aims to further strengthen the integrity of its assets and equipment, thus reducing operating costs and increasing reliability.

Andreas Kemnitz, head of central maintenance at LANXESS, said, "By adopting an integrated approach and involving expert insights and state-of-the-art technology, we have been able to identify improvement opportunities as a result of an evidence-based decision process."

Tim Bisley, managing director, digital products, Lloyd's Register, added, "When a company like LANXESS trusts your technology to support the mechanical integrity programme in their facilities, it validates all the work that we have put into providing our customers with a modern application that adds significant value to their operations and improves efficiency."

Amarinth secures API 610 VS4 pump order for El Merk processing facility in Algeria

AMARINTH, GLOBAL COMPANY specialising in the design, application and manufacture of centrifugal pumps and associated equipment to the oil and gas, petrochemical, LNG, chemical, industrial, power and desalination markets, has secured an order from Groupement Berkine Sonatrach Anaderko for the El Merk processing facility in Algeria.

The El Merk facility is in the southern part of the Berkine Basin which currently comprises four oil and gas fields and is located approximately 300km southeast of Hassi Messaoud in a harsh remote area of the Algerian Sahara Desert. The El Merk mega project is expected to produce oil and natural gas for the next 30 to 40 years.

Although Amarinth has supplied pumps previously to Sonatrach in Algeria and Africa and the El Mark facility, this order is the first taken by Itai Choto, Amarinth's recently appointed permanent sales manager for the Africa Territory, and underlines Amarinth's decision to invest further in Africa. The order is for an API 610 VS4 vertical pump for closed drain drum pump duties in one of the El Mark Oil Trains. The pump will be ATEX certified for use in the hazardous area.

In securing this order, Amarinth worked closely with UK Trade & Investment (UKTI). This department helps UK-based companies succeed globally and has a strong focus on further strengthening the UK trade and investment relationship with Africa.

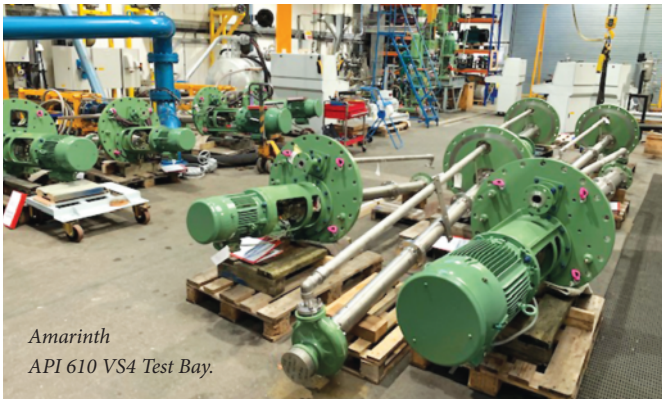


Image Credit: Amarinth

Amarinth API 610 VS4 Test Bay.

Oliver Brigginshaw, managing director at Amarinth, commented, "With our recent focus and investment in the African Territory, and our proven ability to delivery API 610 pumps into the developing oil and gas projects, we are looking forward to continuing to work closely with all end-users, EPCs and contractors in the region."

African Energy Chamber's 2021 Outlook on Equatorial Guinea's oil and gas sector

IN THE 2021 Outlook, the African Energy Chamber has called on African governments and industry stakeholders to come together and do more to support the oil and gas sector's competitiveness and attractiveness. Despite its remarkable resilience, Equatorial Guinea's oil sector is facing the same dire situation as the rest of global energy markets: plunging oil prices, uncertain demand and dry of capital on the back of the energy transition. In such a context, the country has embarked early on an ambitious investment outreach programme with the Year of Energy 2020 and the Year of Investment 2021.

A key concern for Equatorial Guinea's oil and gas industry remains the lack of competitiveness of its fiscal terms and the lack of an attractive enabling environment that supports local private sector growth and jobs creation.

Image Credit: African Energy Chamber

To boost investment, the outlook offers pragmatic solution.

To support recovery and boost investment, the *African Energy Chamber's 2021 Outlook* offers several pragmatic solutions. The Chamber has issued a call to action to policy makers and stakeholders around the adoption of bold fiscal reforms and the modernisation of regulatory frameworks to bring back investors' confidence. Similarly, the Chamber is increasingly engaging with financial institutions and banks on making capital more easily available to local entrepreneurs.

Sudan to offer 27 oil blocks through an international bidding round

SUDAN IS PLANNING to offer 27 oil blocks to the investors through an international bid, according to acting energy minister Kheiri Abdelrahman.

As reported in the *Radio Dabanga* news outlet, the country is set to attract investors with access to advanced technologies for the blocks on offer.

Abdelrahman further indicated that the production plan for the new companies should be consistent with exploration data to reach peak production.

According to the International Monetary Fund (IMF) latest report, South Sudan's secession has led to a decline in Sudan's oil exports and fiscal revenues. Sudan lost about 75% of oil production, 66% of exports and half of fiscal revenues.

According to IMF, oil is expected to be increasingly less important for the Sudan's economy by 2040. Aging oil fields are seen to keep oil production flat over the medium term. The price of Sudan's crude oil is projected to average US$42 per barrel in the medium term, stated the IMF in October.

In the meantime, Sudan and South Sudan have signed a draft agreement. The goal is that Sudan will help South Sudan to restart production from Block 5A and provide technological assistance on blocks 03 and 07, all located on the border between the two states.

Image Credit: Nico Franz/Pixabay

Sudan set to accelerate its oil and gas sector.

PetroNor adds Guinea Bissau acreage to portfolio

PETRONOR, AN INDEPENDENT oil and gas exploration and production company with a focus on sub-Saharan Africa, has announced the purchase of SPE Guinea Bissau AB.

This entitles PetroNor to assume the operatorship (and interest of 78.57%) of the Sinapa (Block 2) and Esperanca (Blocks 4A and 5A) licences in Guinea Bissau subject to government approval.

The licences have been extended for three years and are valid until 2 October 2023, subject to the same attractive fiscal conditions.

Transaction highlights:

- Aligned with PetroNor's strategy to grow position in this highly prospective trend that continues to be a hotspot for exploration activity.
- PetroNor to assume operatorship of two licences with meaningful equity interest (78.57%).
- The Atum and Anchova prospects are analogous to the world-class Sangomar field in Senegal.
- The prospects are 'drill ready', benefitting from significant technical work delivered to date by Svenska Petroleum Exploration (SPE) and partner FAR Ltd.
- Commercially attractive prospects, Atum and Anchova, contain net combined P50 recoverable prospective resources of 568 mmbo (PDC 2019 CPR for SPE).
- Commencing review of rig market with a view to drilling activity in 2021/22 providing transformational catalysts for PetroNor.

GHANA: OPPORTUNITIES AND CHALLENGES ON THE ROAD TO 2030

Tullow Ghana hosted a roundtable during the Africa E&P Summit in September 2020 with senior stakeholders from Ghana's oil and gas. The panel discussed the opportunities and challenges in the sector on the road to 2030. Deblina Roy reports.

A good partnership is built on transparency, and Ghana realises the needs to be more proactive in this area.

Image Credit: Adobe Stock

DURING THE ROUNDTABLE, senior stakeholders from Ghana's oil and gas sector discussed the priorities the government of Ghana and oil and gas companies should focus on over the next decade as the pandemic ebbs and as the industry looks towards energy transition.

The participants were Kadijah Amoah, country director, Aker Energy; Richard Hood, senior research analyst, Wood Mackenzie and Dr Ben K.D. Asante, CEO and managing director at Ghana Gas. The session moderator Wissam Al-Monthiry, managing director, Ghana, Tullow Oil, asked the priorities the government of Ghana and oil and gas companies should focus on over the next decade as the pandemic ebbs and as the industry looks towards energy transition.

> **"Certainty and transparency are key to build up a good partnership between business and the government"**

Speaking about what a good partnership looks like between government and business, especially for Ghana, Richard Hood explained that in this uncertain time, it is more important than ever that all parties across all the boards are on the same wavelength and discuss the same topic with the same alignment towards future objectives. A good partnership is built on transparency, and it does not hide things on the small points. Ghana also realises the needs to be more proactive in this area.

In Ghana, both Ghana National Gas Company (GNGC) and Ghana National Petroleum Corporation (GNPC) have an essential responsibility in terms of gaining investor confidence. "It is more important because operators are now operating in a world where it's not just a subject of an oil price crash. We've got this new variable of the energy

transition. It's unequivocal, and it's going to be more important then ever to built this into dialogues. So, the relationship between GNGC and the IOCs and the transparency behind it are critical."

Kadijah Amoah echoed this. According to her, for many emerging markets in southern Africa that have discovered oil, they almost start by being very friendly to get investment in and for some reason, it starts to get tight. Sometimes, it just keeps getting tighter and according to her, it's not the way to go about it. So certainty and transparency are very important.

Image Credit: Adobe Stock

Ghana needs to put in place the necessary infrastructure to be able to utilise the resources that the country has and meet the demand.

Give certainty to the operator

According to her, the government's announcement about implementing the finance bill is a fantastic idea. If the oil price is low, the government's take could be reduced by a certain percentage, and if oil prices go up on a sliding scale, the government could make far more than they would have made. This gives the certainty to the operator and creates a good partnership that is helping the host countries with capacity. "Ghana's oil and gas industry is relatively new compared to Nigeria or the North Sea. So there is a lot of capacity to be built, and the good thing about government is the fact that they are very open-minded to it. The IOCs are helping to get the resources out of the ground and the government giving a conducive environment to make this happen all before we reach the energy transition would be really great."

Dr Ben K.D. Asante highlighted what a good partnership look like between business and the government for Ghana's future. According to him, access to financing is one of the key hurdles in Ghana as well as in Africa, which comes with some elements of private sector participation and with the public sector being saddled sometimes with enormous competing interest. Private sector participation is the key to providing access to financing, which is critical in getting the appropriate infrastructure. Another area is capacity building in which the private sector has a very important role to play to gain the requisite capacity to handle the industry.

Role of IOCs in preparing for Ghana's energy transition

Speaking about the role of IOCs in preparing Ghana for the energy transition, Amoah stated that the percentage of climate-related shareholder proposals had increased significantly (Goldman Sachs) and Ghana's 50% of those proposals target the energy sector. She said that IOCs need to get the resources out before they become obsolete.

According to Hood, "We're in exploration transition fundamentally, and part of the exploration transition is urbanisation, and again Ghana finds itself in this position where gas/LNG is a bridging fuel to the future. So, the IOCs and the government need to work together to find a tangible solution. Ghana has a very competitive energy market. If there has to be a tandem relationship, there has to be working dialogue, and that's how it needs to proceed moving forward."

Gas is becoming the fuel of choice

Asante then highlighted the role of gas in Ghana's present and future energy transition. Asante said that it is impossible to industrialise without a sustainable, reliable and affordable energy supply, and gas is really becoming the fuel of choice both for power and non-power applications compared to its hydrocarbon siblings. In Ghana, as well as in the rest of Africa, gas has been the mainstay of power generation. Currently, in Ghana, around 90% of the resources, both domestic and regional, that it imports, are used for power generation.

> **"Coming next year and going forward, Ghana intends to use gas as a substitute fuel for heating instead of the liquid fuel, said Dr Asante."**

Gas is also the driver for the petrochemical and agrochemical industries, for fertiliser production, for engines, as well as for pesticides.

Therefore, Ghana is looking to expand the utilisation of gas beyond power generation. Additionally, gas is indeed a cleaner vending fuel. Coming next year and going forward, Ghana intends to use gas as a substitute fuel for heating instead of the liquid fuel. Ghana's Ministry of Railway Development is also planning to use compressed natural gas to drive the raycast instead of diesel. This is also going to be an incredible avenue for utilisation of natural gas in the rail transport industry as well.

He further noted that Ghana needs to put in place the necessary infrastructure to be able to utilise the resources that the country has and increase the demand. With the move to use gas beyond just power generation, there will be more cases where Ghana will see more demand than supply.

NAMIBIA'S FRONTIER HOTSPOTS COULD BE A "GAME-CHANGER"

Namibia is very much a frontier exploration area that has tremendous potential for E&P companies. Major exploration companies are confident of discovering huge crude oil reserves in the near future.

BORDERED BY ANGOLA, Botswana and South Africa and the long inhospitable coastline of the South Atlantic, Namibia is rich in natural, mostly mineral, resources that largely sustain the country's 2.5mn population. Namibia is the world's top diamond producer (by value) and fourth-largest uranium producer.

Historically it remains one of the most 'underexplored' hydrocarbons onshore/offshore acreages of Africa. However, that is rapidly changing with exploration companies confident of discovering crude oil reserves in Namibia.

Namibia's varied and promising geology potentials have received the attention of various explorers for now almost a century. Its onshore basins cover more than 60% of the country. Two vast Neoproterozoic/Early Cambrian basins, the Owambo-Etosha basin in the northern region and the Nama basin in the south, are attracting keen interest from exploration companies. These basins cover more than 470,000 sq km and early Cambrian pan-African orogenic belts flank both.

The country's offshore basins are believed to be hydrocarbons-rich because it forms a part of the plate tectonic 'conjugate' offshore Brazil, where world-scale oil and gas discoveries were reported in recent years. Seismically, Namibia

Image Credit: Adobe Stock

Namibia has a number of oil and gas prospects that are yet to be explored.

offshore acreage has a partial similarity to Brazil, with the Walvis and Orange basins mirroring the Santos and Campos basins – reckoned to possess 16bn barrels of 'pre-salt' crude reserves. Geologists believe the same sub-salt source rocks are in existence off Namibian coast, and oil seepage and slicks offshore indicate a working oil-prone petroleum system.

Despite now being separated by the Atlantic Ocean, the African and South America continents were connected some 200mn years ago under a super-continent 'Gondwanaland' that incorporated present-day South America and Africa. Researchers led by Dr Marcio Mello revealed that Orange basin off Namibia have similar source rocks as Brazil, making the prospect of Namibian oil production a realistic one. The area also lies on the West African continental margin adjacent to Angola, where many large discoveries have been made.

Thus, the frontier country boasts proven basins and active petroleum systems. "Namibia is a vast country and we've barely scratched the surface. There's a number of prospects that still need to be tested," said Maggy Shino, Namibia's Petroleum commissioner. There are very few known major oil or gas acreages left to discover, except in a few wildly underexplored parts of Africa.

Fresh momentum

Namibia's geological promise has enticed attention from oil majors, independents and juniors. Supermajors such as ExxonMobil, Royal Dutch Shell, British Petroleum and Total are looking to southern Africa for the next elephant finds. Total announced plans to test the giant Venus prospect in ultra-deepwater well in the Orange basin, which covers more than 470,000 sq km. The UK-based consultancy, Wood Mackenzie reckons Total's Venus-1 well offshore Namibia (billed as Africa's deepest-ever), has the potential to achieve a sizeable discovery.

In 2019, ExxonMobil acquired seven million net acres to expand exploration activity in the Namibe basin by signing a production-sharing contract with the National Petroleum Corporation of Namibia (Namcor) covering blocks 1710 and 1810 – betting that offshore geology is similar to Brazil, which is seeing a boom in oil production. The Petroleum commissioner noted Shell also plans to drill in the Orange basin.

"The next three years will be an interesting time for exploration."

There has been a flurry of other companies farming into exploration acreage. These include India's state-owned ONGC Videsh Ltd, which owns minority stakes in blocks in the Walvis basin; China National Offshore Oil Corp (CNOOC); Portugal's Galp Energia; Repsol (Spain); Brazil's HRT Oil & Gas Ltd; US independents Kosmos Energy and Hunt Overseas Oil; UK-based Tullow Oil; Chariot Oil & Gas Ltd, Tower Resources and Reconnaissance Energy Africa; Pancontinental (Australia); Canadian-registered Eco Atlantic; and French-owned Maurel et Prom, which plans drilling a well in the Walvis basin in late 2021 or early 2022.

Namibia is moving into the spotlight as exploration and production (E&P) companies increase their presence along the Namibian margin helped by good geology, favourable fiscal regimes and incentives. The laws around hydrocarbons are relatively new, yet it is one of the friendliest regimes for explorers in frontier regions. Major features include corporate tax (32%) on oil reserve profits; State royalty of only 5% (the lowest in Africa) and negotiable additional profit tax when the internal rate of return exceeds 15%. Other incentives are off-road marine diesel fuel rebate, no capital gains tax and customs exemptions on imports of equipment and consumables.

Rivalling the US shale play

Potentially Namibia sits on the world's largest underexplored onshore hydrocarbons sedimentary (8.75mn-acres Kavango basin) – bigger in territory than Eagle Ford (6.9mn-acres basin) plus as deep as the Permian basin in south Texas – which put the USA on global map of top oil producers. The Permian produces nearly five million bpd per day – equivalent to total Iraqi oil output. Not only does Kavango appear to be analogous to the US basins, but also to South Africa's 600,000-km Karoo sedimentary basin – home to Shell's vast Whitehill Permian shale play, which ranks among the top 10 shale projects in the world with recoverable reserves of 370 tcf (Energy Information Agency).

Namibia has great potential to unearth major oil reserves in Africa.

Image Credit: Adobe Stock

Most geologists agree Namibia's Kavango basin could prove the last major onshore oil discovery on earth. A prominent shale sector pioneer, Dan Jarvie of Worldwide Geochemistry reckons there is potential for 120 bbo equivalent in the Kavango basin. World-renowned geologist and geophysicist Bill Cathey, the president of Earthfield Technologies in Houston and a geologist to the supermajors, echoed, "Nowhere in the world is there a sedimentary basin this deep that does not produce commercial hydrocarbons.

"I don't know if it will be that big on the world-class scale because it's too early and the drill campaign gets off the ground. But I will say this: it's the same setting, the same geological time frame, and looks like the same type of thickness. The Permian section of Kavango will be 6,000-8,000 feet in depth, which is the same as the Permian in Texas," drilling completion expert Nick Steinberger, told OilPrice.com. The Kavango Basin offers both large scale conventional and non-conventional play types.

Interestingly, a small London-based E&P co Reconnaissance Energy Africa (ReconAfrica) controls the entire Kavango basin and exclusive rights to estimated 18.2 bbo-in-place – including Recon's Botswana portion of the basin. It holds a 90% interest (the government owns 10%) under a four-year E&D license, plus a 25-year production license once a commerical discovery is made. ReconAfrica is working closely with USA' Seidel Technologies to acquire North American drilling rig and ancillary equipment, specifically designed for Namibian logistics and drilling depths of the Kavango basin.

Offshore acreage is equally viable on the scale of North Sea or Gulf of Mexico. In 2019, the Ministry of Mines and Energy announced the conclusion of a study that "identified 44bn barrels of potential off the coast, yet despite a vast exploration area of some 500,000 sq km this virgin territory is almost completely unexplored." Both offshore/onshore numbers, however, are only potential estimates. Thus, until exploration wells are drilled and/or a significant discovery reported, nothing could be certified by external audits. If the numbers prove correct, Namibia would be sitting on the largest oil reserves in Africa.

Investor optimism

If oil is found in commercial quantities (upstream successes), Namibia's low population density means it would have huge 'multiplier-effects' upon the economy. The difference between Namibia and Angola is that there are only 2.5mn people in Namibia, compared with Angola#s 31mn, so every barrel explored and produced, plus royalties and taxes paid by oil companies should make a tremendous difference to government finances.

Paul Welch, CEO Chariot Oil & Gas, echoed that large oil discoveries and continuation of business-friendly policies could transform Namibia into an economy like Norway. "It will be a true gem . . . I think Norway would be probably the best equivalent to what you would expect if Namibia maintains the current path that it is on." A relatively well-developed basic infrastructure, political stability, good governance and a vibrant financial sector also make Namibia a benign market for foreign investors."

In sum, Namibia is very much a frontier exploration area that has tremendous potential for E&P companies. Recent exploration activities in Namibia, when oil prices eventually recover and stabilise, will be areas to watch for continued investment and follow-on, future exploration. The Southern African country is promising hotspots for drilling and future oil production.

– by MOIN SIDDIQI, economist

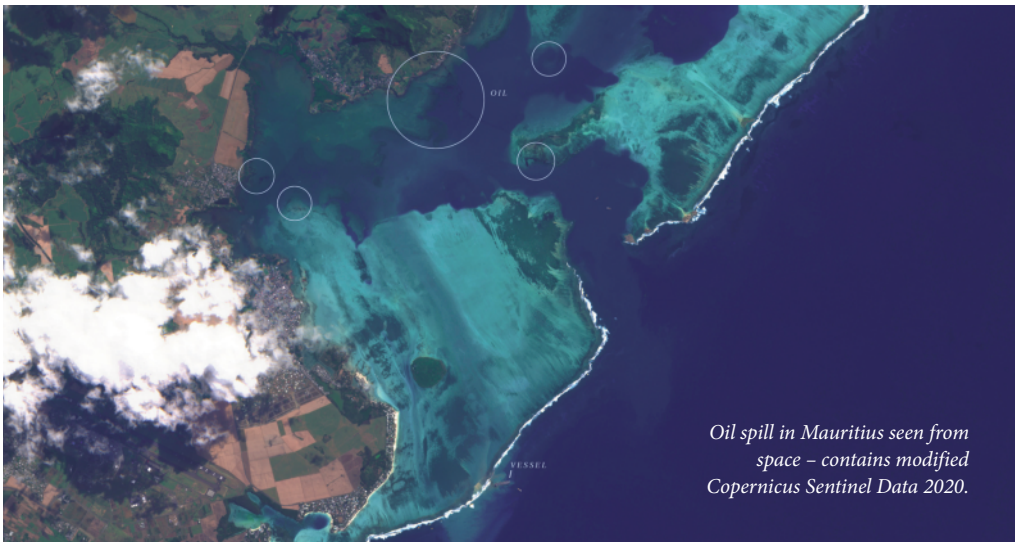
CAN OIL SPILLS BE MINIMISED?

The later an oil spill is detected, the higher are the amounts spilled. Fast detection of oil spills helps operators to deliver a cost-effective response. Deblina Roy reports.

OIL SPILLS CAUSE substantial reputational and financial losses to oil producers and can damage the equipment of desalination plants, thus endangering water supplies. The MV Wakashio oil spill incident in offshore Mauritius, after the Japanese bulk carrier Wakashio ran aground on a coral reef on 25 July 2020 caused the worst-ever environmental disaster in Mauritius, with an estimated 1,000 tonnes of oil spilt into the ocean. Two weeks after the incident, the Mauritian government declared the incident a national emergency.

To add to this, in November 2020, in a landmark judgement, the Supreme Court of Nigeria declined Royal Dutch Shell's application to set aside a previous ruling that ordered the company to pay US$467mn for damages caused by an oil spill almost five decades ago in Ejama-Ebubu in Rivers State.

These are just two among many such occurrences which have highlighted the need for effective oil spill management. Oil spill management is set to record significant growth in the coming years owing to increasing circumstances of oil spill events in recent years. The expected rise in seaborne and pipeline transportation of crude oil and chemicals, along with increasing offshore and pipeline tanker transportation of petroleum products, is triggering the demand for cutting-edge technological advancements to detect and prevent oil spill disasters efficiently.



Oil spill in Mauritius seen from space – contains modified Copernicus Sentinel Data 2020.

Image Credit: Adobe Stock

Osprey Spill Control has launched environment-friendly solutions to recover oil and other hydrocarbon-based liquid spills. In line with the company's ambition to ensure environmental sustainability, Osprey's range of solutions including sorbent technologies, spill kits, granular absorbents and neutralisers focus on cleaning the oceans, freshwater rivers and streams of all hydrocarbon pollution from oil spills from any source.

> **"Polarisation technology helps to to rapidly recognise oil spills with outstanding accuracy"**

Lamor Corporation has introduced a wide range of skimmers, oil booms, pumps, power packs, landing crafts, workboats, storage and ancillary equipment to check uncontrolled oil spills and leakages that have caused contamination of soil, water and air.

Polarisation technology to rapidly identify oil spills

Speaking during an online event on 30 September "To track an oil spill, think like an oil spill," Pavel Tatarintsev, NNTC R&D Head, said that polarisation technology helps to rapidly recognise oil spills with outstanding accuracy, identifying crude and refined oils while detecting in waves and calm water.

Tatarintsev explained that polarisation can trace and clean up oil leaks by removing any electromagnetic waves from the beam, except for those being in a certain plane of polarisation. The polarisation cameras, distinguishing chemical compounds on the water surface, can help to monitor the drilling process and oil leaks.

Desalination plants can use polarisation to prevent oil or other contaminants from flowing inside along with the seawater and avoid engine damage.

SAFETY MONITORING IN REMOTE OILFIELDS

Data and wireless technologies can detect flammable gas in remote oilfields and enhance safety. Aarti Dange, MEA business development manager for Plantweb Digital Ecosystem, Emerson Automation Solutions, highlights more.

THE OIL AND gas extraction and production process involves moving huge volumes of highly flammable hydrocarbons at long distances. Even in the case of abandoned wells, there is a possibility of hydrocarbons in a gaseous state to escape to the atmosphere, making the oilfield a fire prone area. The remote nature of the oilfields reduces accessibility during an emergency.

A recent mishap in Nigerian waters of a workover hydraulic rig, which burst into flames, was due to fluids released to the surface. The offshore oil rigs of the Namibian waters are also threatened with H2S emissions as a second distinct hydrogen sulfide emission event that occurred closer to the coast. This makes flame and gas detection and monitoring systems a necessity on all remote oil wellheads onshore, offshore, pipelines, gathering centres and processing areas.

Monitoring and Communication

Emerson's technologies for flame and gas detections are Optical triple IR Flame detection, having immunity to direct or reflected sunlight and lightning, Open Path IR type flammable and UV type toxic (H2S/NH3) gas detection which is used for wellheads and pipeline perimeter. Emerson offers a wide portfolio of fixed gas detectors for localised detection of CO, H2S and CO2.

> **"Emerson's location Awareness system aims to provide relevant-time, safety-focused monitoring of personnel."**

Aarti Dange is MEA business development manager for Plantweb Digital Ecosystem, Emerson Automation Solutions.

These devices are placed inside gas separator enclosures or installed on the wellheads.

Aspirated gas sampling systems measure the concentration of specific components in a gas stream flowing through duct using an external instrument. These are deployed for remote and inaccessible locations. These detectors are wireless HART-enabled which communicate to the central control room in real time about the gas leaks, especially in remote locations. All the mentioned technologies are installed in Algerian fields as a fire and gas detection system. With Emerson's Optics Analytics portal, it is possible to have consolidation of all the data from the various installed systems and devices and send out relevant alerts to the key stakeholders including the well operators, supervisors and HSE managers.

People safety

Emerson's location Awareness system aims to provide relevant-time, safety-focused monitoring of personnel. It is enabled by WirelessHART and consists of Anchors and battery-operated Personnel and Asset Tags. In the current pandemic situation, this system is useful for tracking the population density around the processing areas to ensure social distancing.

Executive action

As the next action, the safety system initiates a shutdown and isolates the well, putting it into a safe state. The Safety Instrumented function has four levels of safety performance as per the international safety standard IEC 61508, ranging from one to four, where four is the highest safety integrity of the safety systems. At the wells, normally SIL2 or SIL3 are designed to provide the desired protection and risk reduction at the well site. Emerson normally deploys DeltaV SIS with Electronic Marshalling. This system provides the gas/oil well with the fast-automatic shutdown function in response to the detected hazardous event.

Emerson's holistic solution caters to all the requirements of an effective fire and gas system, ensuring oilfield safety right from the realtime monitoring and communication of the hazard, mapping people working in these areas for their safety, data consolidation and messaging, and finally the emergency action taken by the DCS to shut down the wells.

SOLVING THE FLARE GAS CHALLENGE IN AFRICA

Billy Morley, global head of oil and gas at Aggreko, explains how the flare gas can be turned into a valuable resource to meet the power demand in the continent.

IN THE SUB-SAHARAN region, approximately 75% of the population lives without access to reliable or stable energy. And yet, Africa flares around 40 bcm of gas, annually, of which 35 bcm are flared in sub-Saharan Africa. These statistics provided by ResearchGate highlight how much gas is being wasted and the importance of investing in solutions that minimise this in favour of changing the African power conversation.

The gas that is being wasted by flaring can provide power to people that desperately need it, instead, it burns to waste and pollution. But what if there was another way?

Image Credit: Adobe Stock

For oil producers, flaring is going to start costing money in legislation and climate change regulation.

Flare to power

In Africa, Aggreko has recently completed a gigawatt of projects that use the concept of flare to power. The company has developed end-to-end solutions that have positioned them as the go-to provider for this type of project on the continent, and the company is still evolving its offerings to further minimise the problems caused by flaring. These are not multi-million-dollar projects that require an extensive financial commitment from the gas companies, they are simple and intelligent solutions that can be used by anyone.

Currently flared gas is a problematic by-product and as governments put more robust legislation in place and implement fines, this flared gas could end up becoming an expensive line on the balance sheet. It has no value to the business today and it will likely become an expensive problem very soon. But what if this could be used as a free or subsidised fuel source? What if operators could have the problem taken off their hands at a low cost to their business but with a solid benefit to their reputation?

With the right solution, it is possible to deliver cheap and stable power using this, essentially, free fuel that only costs as much as the service provider charges. For Aggreko, this requires a simple connection to a grid and gas treatment, but after that, the system produces power that is hugely competitive in price compared with traditional power infrastructure and that will deliver cheap and accessible power to people living in communities. Communities that had, until now, faced a future of both physical and light pollution.

A stable alternative

Not only does flare to power provide a cheaper and more stable energy source, it removes a future energy problem right off the table. For oil producers, flaring is going to start costing money in legislation and climate change regulation. However, they now can turn the problem on its head, to translate pollution into accessible power for governments, businesses, and citizens. And to shift reputational blame into a reputational advantage. This is further enhanced by the fact that they can charge for this service, essentially turning a waste product into a profit.

Currently, the gas situation on the continent is precarious and yet gas power is probably the most important part of the energy mix. It is significantly cleaner than coal and liquid fires, and it runs at a stable level – one that renewables cannot necessarily match.

Aggreko takes the gas that would normally be flared, puts it into a generator, and creates power. While the generators have their own emissions, they are lower and far less intrusive than flaring and therefore do not add to the pollution burden. If power companies embark on the flare to power journey, they can shift their balance sheet, change how they impact the environment, align the business with incoming climate regulation, and transform their reputation. It is an intelligent solution to a problem that has had a negative impact on the country and citizens, and it is one that any company can benefit from in a matter of weeks.

WELLS UNDER CONTROL

International well control expertise is being passed on to a new generation of indigenous players serving Africa's oil industry. Martin Clark reports.

Image Credit: Adobe Stock

Employee safety and accident prevention are the top priorities of well control management.

WELL CONTROL IS a fundamental part of oil and gas production world over. From maintaining pressure to underpinning safety, it is the domain of industry big-hitters like Schlumberger and Halliburton, as well as many other smaller and specialist providers.

As well as performance, safety and accident prevention remain the highest priorities.

Well control is integral in the prevention of blow outs, for instance, one of the deadliest threats facing drillers in the field.

The challenges are even greater working offshore, as the tragedy of the 2010 Deepwater Horizon blow out in the US Gulf of Mexico highlights.

But lessons have been learned, and West Africa's offshore has thrived in recent years providing a rich stream of work for leading operators in this niche.

One of the busiest working off Angola right now is Oceaneering, which is bringing its deepwater well expertise to some of the region's biggest projects.

In June, it announced that its asset integrity group had secured a three-year contract with Cabinda Gulf Oil Company Limited (CABGOC), a Chevron subsidiary, for inspection services on Blocks 0 and 14.

It is also currently providing riserless light well intervention (RLWI) services in Blocks 18 and 31 for BP in support of a multi-well campaign that includes mechanical well interventions, well stimulations, and tree change-outs.

Oceaneering is providing personnel, equipment, remotely operated vehicles, survey and communication services, all integrated onto a chartered multi-purpose vessel.

Another major player active in Angola is offshore drilling expert, Seadrill.

It is Sonadrill joint venture, with state-owned Sonangol, is in the middle of a nine-well contract working from the Libongos drillship.

The work, which includes an option for six more wells, runs through to 2021.

These and other companies are helping ambitious indigenous firms to build knowledge in well control and other areas of training.

Again, in Angola, Instituto Nacional de Petróleos (INP) is developing vocational programmes to better prepare workers for the oil industry.

Several years earlier, INP invested in Drilling Systems' state-of-the-art drilling and well control simulator technology, including its DrillSIM:5000, DrillSIM:500 and DrillSIM:50.

This is used by INP to give its drilling and well control students a taste of what it's like to work on actual rigs and enhance understanding of drilling operations and reservoir behaviour.

INP has now trained people from all across Africa, enhancing local know-how that is now deployed in the field and nurturing a new generation of skills and talent.

Local expertise has enabled indigenous well services firms to grow in some of Africa's key oil markets, like Nigeria.

That includes the likes of Petron Drilling, Maerlin Limited, Cardinal Drilling, Century Group and Warri-based Weafri Well Services.

Increasingly, it will be expertise from these and similar firms that will be responsible for well control services as Africa's oil and gas industry matures.

COUNTERING THE CYBER THREAT

The success of Africa's oil and gas industry hinges on rock-solid IT security. Martin Clark and Deblina Roy report.

IN A TECH-DRIVEN world, IT security has become a high priority for oil operators.

The Shamoon virus attack that struck Saudi Arabia's state oil giant Saudi Aramco in 2012, damaging 30,000 computers, highlights what has become a very real threat.

Remarkably, there was no disruption to output, with the world breathing a sigh of relief given that Aramco pumps 10% of global oil supply.

Yet it reflects a general increase in the number of cyber attacks taking place.

Indeed, security experts Kroll reported that around 87% of oil and gas executives have faced down cyber incidents in the past 12 months.

Angola's Sonangol is among those to have reported cyber attacks in the past year.

In October this year, Nigerian National Petroleum Corporation (NNPC) also reported that its security had not been breached following a wave of attacks on major corporate sites in the country.

It is not just office computers or upstream production under threat. A recent report by the Institute for Security Studies on maritime cyber security risks in Africa suggests that an attack could just as easily target a logistics hub, such as a port, with huge disruptive effects on the supply-chain network.

Africa's oil and gas exports rely on seaborne trade: as an estimated 90% of all African trade is conducted by sea, mostly via 90 major ports.

Worryingly, it says most states are not yet dedicating sufficient resources to address current and future cyber security challenges.

"Ports, shipping companies and maritime businesses are now integrating new innovative technological solutions at a greater rate, including automation, big data and the internet of things," the report noted.

New threats

But with this digital transformation comes new threats, it warns.

"The severity of cyber security incidents, like data breach, malware attacks and hacking, can range from negatively affecting a workplace to potentially disrupting entire supply chains."

With Africa poised to grow rapidly in the coming decades, IT security will become increasingly embedded into the energy sector as it evolves.

The "Accenture Upstream Oil and Gas Digital Trends Survey 2019" also highlighted that cybersecurity has emerged as the top focus of upstream oil and gas companies' digital investments. The report is based on a global survey of 255 industry professionals, including C-suite executives, leaders and engineers. When respondents were asked which digital technologies their organisations are investing in today, cybersecurity was cited more than any other, by 61% of respondents – five times higher than the 12% who made that claim in 2017. The report suggests that the focus on cyber resilience is increasing sharply as oil companies seek to protect their assets and reputations.

The survey has identified cloud technologies as the second-biggest focus for digital investment, cited by 53% of companies. In fact, 15% of respondents identified cloud technologies as digital solutions driving the greatest business performance impact. The report suggests that oil and gas companies are still investing heavily in cloud technologies because they are a foundation for their digital transformational journeys and for greater operational security.

Operators need to learn hard truths from experiences in the mature oil-producing regions.

Image Credit: Adobe Stock

DECOMMISSIONING: LEARNING FROM EXPERIENCE

Africa stands to gain from the experience of others as it gets to grips with oil and gas decommissioning work. Martin Clark reports.

AS WEST AFRICA'S oil and gas industry matures, decommissioning of ageing facilities comes ever more into focus.

Countries such as Nigeria, Cameroon, Congo and Angola have now been producing for decades and are taking a greater interest in how to deal with assets nearing their end of life.

Operators in these and other locations are expected to learn hard truths from experiences in other mature oil-producing regions, such as the North Sea.

Especially in the age of environment awareness, how companies rise to the challenge of decommissioning has never been more important.

Even in newer oil territories, such as Mauritania, cleaning up exploration and other oil field equipment has provided work for industry experts such as Maersk Decom. It was set up two years ago as a joint venture between Maersk Drilling and Maersk Supply Service to respond to the increasing need for decommissioning services in Africa and elsewhere.

Both founding partners have long experience working right across West Africa's oil and gas sector. The company is currently working on a contract for the plugging and abandonment of Tullow Oil's Banda and Tiof fields offshore Mauritania.

After planning and engineering and site surveys this year, offshore execution is expected to commence early in 2021. The Banda and Tiof fields are located 53km and 84km respectively off the Mauritanian shoreline, in 1,200m water depth.

Part of the project team is based locally in A.P. Moller – Maersk's Nouakchott office, while the rest of the onshore team is supported by Maersk Decom's headquarters in Denmark.

It underscores the importance of the North Sea experience in dismantling West Africa's ageing and unwanted oil and gas infrastructure.

Mark MacFarlane, Tullow's chief operating officer, said that the involvement of Maersk Decom builds on the success of its other recent decommissioning work in the UK Continental Shelf.

The Maersk Decom project includes the execution of plug and abandonment of seven legacy exploration and appraisal wells, all drilled over a decade ago, as well as the removal and disposal of subsea equipment.

The Danish joint venture is providing all personnel, assets and equipment required for the project, including a drilling unit and offshore support vessels.

While West Africa has not yet reached the same level of maturity as the North Sea in terms of decommissioning, it stands to benefit greatly from its expertise and reap potential cost savings as a result.

In a report charting the lower costs of decommissioning in Europe, compared to certain other regions, such as south-east Asia, consultancy Rystad Energy highlighted the significance of the North Sea's established rules and regulations.

"The North Sea represents a more mature market where regulations governing the removal of offshore structures are more formalised and consolidated."

Rystad Energy estimates the total value of the global pool of decommissioning projects that will accumulate through 2024 could reach US$42bn, led by activity in the UK and Europe.

WHAT'S HAPPENING WITH EPC?

In the oil and gas industry, engineering, procurement and construction (EPC) is part of a contract agreement. The EPC contractor carries out a detailed design and layout to deliver an effective asset to the client.

ENERGY CONSUMPTION IS increasing day-by-day on account of the growing population and power consumption per capita. Although there is an increasing trend of power production from renewable sources, energy production from oil and gas still dominates the sector. According to a ResearchAndMarkets report, the global oil and gas EPC market accounted for US$43.6bn in 2019 and is expected to reach US$75bn by 2027 growing at a CAGR of 7%.

Oil and gas EPC market growth is driven by energy consumption demand worldwide.

Image Credit: Adobe Stock

Recently, TechnipFMC announced the completion of the remaining conditions required to commence work on the EPC contract with Assiut National Oil Processing Company (ANOPC). In July 2020, TechnipFMC signed the EPC contract with ANOPC for the construction of a new Assiut refinery hydrocracking complex in Egypt. The EPC works cover a Vacuum Distillation Unit, a Diesel Hydrocracking Unit, a Delayed Coker Unit, a Distillate Hydrotreating Unit and a Hydrogen Production Facility Unit.

Earlier this year, TechnipFMC was awarded a significant integrated engineering, procurement, construction and installation (iEPCI) contract (worth between US$75mn and US$250mn) for the BP Platina Field in Angola for the field located offshore Angola in Block 18 at water depths ranging from 1,200 to 1,500m.

In February 2020, Italian offshore contractor Saipem won several EPCI contracts in various countries around the world worth more than US$500mn. In West Africa, Saipem was assigned a contract by Eni Angola S.p.A. related to Cabaça and Agogo Early Phase 1 developments. The scope of work includes the EPCI of risers, production flowlines, jumpers and the installation of a Subsea Production System (SPS) in water depths ranging between 400 and 600m to be carried out by Saipem vessels FDS and Saipem 3000.

In November 2020, Nigerian National Petroleum Corporation (NNPC) announced EPC bids for engineering work on Port Harcourt Refinery. The refineries, situated at three sites, have run only sporadically and NNPC closed them earlier in 2020 for upgradation.

Another significant developmental project is Tanzania Liquefied Natural Gas Project. Oil and gas majors such as Equinor, Shell, ExxonMobil, Ophir Energy and Pavilion Energy continue to make plans for the Tanzania LNG Liquefaction Plant, the construction of which is expected to start in 2022, with the facility coming on line in 2028.

Nigeria's Dangote Group is developing a 650,000 bpd downstream facility in Nigeria's Lekki Free Trade Zone, with an aim to produce 153,000 bpd of gasoline, 104,000 bpd of diesel, 73,000 bpd of jet fuel, 4,109 bpd of LPG and 12,300 bpd of fuel oil.

In Angola, Rail Standard Service and Fortland Consulting Company, along with local partners, agreed to build a 400,000 bpd refinery in Namibe, which is expected to start in 2028.

However, speaking about the challenges in the oil and gas EPC market, Pritam Kad, oil and gas analyst at GlobalData, commented, "In this difficult situation, key challenges for EPC projects are the supply chain, workforce management, increased subcontracting work timelines dependency, and subsequent cost over-runs. There could be a need for contract renegotiation, with project owners, due to contract, compliance issues that might further strain the overall project financing for EPC companies."

ARE YOU READY FOR ON-THE-FLY DRILLING ADJUSTMENTS?

High-tech oil and gas wells require the use of advanced drilling technologies. Constant monitoring of drilling operations in difficult wells and prompt decision-making based on the updates coming from fields is need of the hour.

IN THE OIL and gas industry, drilling and completion technologies are aimed at increasing flow rates, boosting efficiency, cutting field infrastructure CAPEX and mitigating the environmental impact. Over the past years, oil and gas majors have been advancing drilling technologies for oil and gas wells, allowing oil and gas operators to successfully optimise their rate of penetration to reduce well construction costs.

Recently, Schlumberger has launched the MagniSphere high-definition NMR logging-while-drilling service to deliver accurate, real-time producibility analysis for optimum well placement. According to a press statement by the company, MagniSphere service has undergone extensive field testing, including in the Black Sea region where it enabled an operator, who was drilling an extended horizontal section to better characterise the reservoir porosity and permeability profile, improving well placement into a higher quality pay zone. "MagniSphere service provides operators with a full understanding of reservoir producibility while concurrently enabling enhanced drilling performance," said Jesus Lamas, president of well construction at Schlumberger. "The service provides operators with automated, high-definition NMR data while drilling, which is used to maximise reservoir exposure and ultimately optimise production."

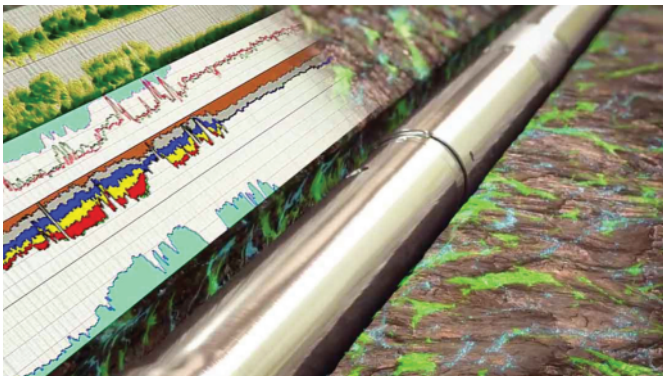


Image Credit: Schlumberger

Schlumberger's MagniSphere high-definition NMR logging-while-drilling service delivers real-time producibility analysis for optimum well placement.

Weatherford International's Velox wellhead system and Vero automated connection integrity system are set to help operators to lock in pressure integrity while enhancing safety and improving efficiency.

> **"Achieving drilling performance requires efficiently converting energy into rock cutting," said David Loveless, vice-president of Drill Bits and Services, Halliburton."**

Dean Bell, president, drilling, evaluation and intervention, Weatherford, said, "The Velox wellhead system enables operators to lock in pressure fast. Operators can run the upper and lower packoff assembly from the rig floor to isolate the annuli of multiple intermediate and production strings."

"Vero is the most disruptive technology ever introduced in the tubular running space and operators around the world are taking notice and benefiting from the exceptional value," noted Bell and added that "the solution can minimise the chance of catastrophic well failures, associated with poorly made up connections, significantly reduce the total cost of well ownership, minimise safety risks and protect corporate reputation."

Additionally, Weatherford International's RipTide drilling reamer and JetStream circulation sub are used to enhance drilling performance while mitigating costs per trip; the logging-while-drilling (LWD) systems deliver high-quality reservoir-characterisation data that enhance reservoir understanding and enable on-the-fly drilling adjustments.

The Cerebro Force in-bit sensors from Halliburton is built to capture weight, torque and bending measurements directly from the bit to improve understanding of downhole environments, optimise bit design and increase drilling efficiency.

Meanwhile, Neptune Energy has announced that it will adopt Halliburton's DecisionSpace 365 well construction suite of cloud applications to consolidate all global drilling and well activities, improve efficiency and significantly reduce non-productive time. The three-year agreement – part of Neptune's digital subsurface programme – will create a platform for Neptune's digital well programme. It aims to reduce the duration for planning wells from weeks to days, automate engineering calculations and consolidate data currently held across multiple global locations into one.

THE FIVE QUESTIONS TO ASK

Derek Crombie, vice-president of software development at Lloyd's Register, answers five questions that E&P firms need to address when thinking about reservoir interpretation solutions.

THE OPPORTUNITY FOR sub-surface optimisation in reservoir production is a significant one. So much so, that in a 2017 report, McKinsey analysts estimated that an analytical approach to production could improve the global average for underground recovery by 10%. That's the equivalent of unlocking an extra one trillion boe.

As the industry moves away from the giant fields of the past, with a "maximise peak capacity at all costs" development strategy, towards smaller fields and phased activity, the data-driven, analytical approach has never been more appropriate. To make all this happen, E&P firms need the right petrophysical analysis tools, to both understand the potential of a new well or basin, and to optimise production from existing reservoirs.

When choosing the petrophysics analysis software that will actually deliver real benefits to the business – from the reservoir all the way up to the board room – the geoscience team need to answer the following five questions:

1. Does this solution offer real value for money?

A simple price comparison is not enough, and neither is a simple 'tick box' comparison of functionality. The efficiency of the workflows is fundamental to the productivity of the team, so instead of asking 'can this software do xyz' you should be asking 'how effectively does this software do xyz."

To really add value to the organisation, your solution should also deliver advanced functionality as standard. It should be able to work on live well data and enable the geologists, petrophysicists and engineers to combine their understanding and refine their analyses in real time.

2. Does it make it easy to do the right things?

In the early hours of the morning, when operators and investors want to know both the quality and the quantity of their hydrocarbon in their potential new well, they want to know it immediately. That means you need software that is not only accurate and precise, but intuitive, and easy to use, in what is often a highly stressful environment, and as immune to human error as possible. No software delivers value if it takes too long or is riddled with human input errors.

Choose solutions that come with pre-built roadmaps to speed up formation evaluation and geomechanics. Make sure it is compatible with a wide range of file formats and can accept and work on all data types without harmonisation. A straightforward user interface, with menus of pre-entered formulae and strong visualisation and plotting tools are essential for that midnight analysis, as are touch-screen enabled raw-data editing, depth shifting and filtering functions. By deploying visual data interpretations and using interactive parameters within each zone to test input changes, you get faster, more consistent results. If these aren't quite what you need, then your chosen solution should have intuitive coding tools to build your own bespoke applications.

3. Is it independent and interoperable?

There is something tempting about software that is optimised for a single measuring device or family of devices. It intuitively feels that if hardware and software are designed to work together, it may get the best results.

But that's not the case here. When both components come from the same vendor, you can end up with confirmation bias in the results: the software confirms that the hardware is 'correct', and the hardware doesn't deliver the measurements that challenge the software.

4. Does it offer surety of insight?

The best reservoir and petrophysical analysis tools are developed by those who work in the field, who have sat on the stressful end of that 3 a.m. demand for an interpretation, and who can encapsulate that experience into the product. These are the providers who can make the link between what is going on in the reservoir and what it means for the E&P business as a whole. Those specialist providers will have a decades-old – even centuries-old – content library of data and experience that only adds to the richness and quality of their output, and the confidence that operators can have in their insights. Moreover, the values and principles that ground them shine through in their approach and interaction with customers.

5. Is it future-proof?

This is perhaps the most important question of all. The point at which technology meets oil and gas exploration is continuously moving, because both sides of that relationship are in a period of mutually interdependent and rapid change. Just as neural networks, machine learning algorithms and AI are on the cusp of delivering predictive models that improve as they absorb more data, E&P is facing an unpredictable future of energy transition, changing public opinion and new cost pressures.

THE FUTURE OF AFRICA OIL IN A POST-COVID-19 WORLD

Africa could take a key seat in driving oil production in the future if appropriate post-COVID-19 recovery measures are put in place, says Boris Ivanov, founder of GPB Global Resources B.V.

AFRICA HAS LONG had the potential to emerge as a major player in the global oil and gas markets. The continent is home to five of the top 30 oil-producing countries in the world and in 2019 already accounted for more than 7.9mn bpd or 9.6% of world output.

COVID-19 has had a visible impact on the economies of oil producing African nations, leading to disruptions in the oil sector and widening fiscal deficits. This has been painfully evident in Nigeria, where oil accounts for 57% of government revenues and 10% of the country's GDP. Capital Economics, an economic research consultancy, projected that Nigeria would suffer its worst economic hit for 35 years by the end of 2020 and in Angola, Africa's second largest economy, the pandemic has managed to halt drilling across the entire country, something that even a civil war failed to do.

While the continent has so far recorded a lower coronavirus death toll than other continents, the WHO predicts that a quarter of a billion people in Africa are at risk of contracting the virus in the next year. And with annual budgets premised on higher oil prices, many African governments have had to cut expenditure or source additional finance. New licensing for fossil fuel exploration is also diminishing, and projects are being delayed or cancelled.

However, demand has rebounded as economies start to rebuild – buoyed by the news of the vaccine. Africa will now need to lay down a framework for recovery.

Economies which are oil import-dependent are already developing policies to diversify their energy mix to ensure energy security and become less reliant on oil imports. Some countries started to change their approach pre-pandemic against the backdrop of both the Paris Agreement and wider concerns about the adverse impacts of climate change. It is important that energy resources are balanced in a sustainable and equitable manner that will support the growth of the African economy.

Measures on how best to support the local industry to navigate the impact of COVID-19 are being reassessed. While the coronavirus may be a new phenomenon, supporting entrepreneurship and stimulating the diversification of African economies has always been a long-term challenge.

African governments should be working hard on regulations that will foster an enabling environment for investors and businesses. The sector will need both indigenous experts and suppliers, as well as partnerships with foreign companies, who are willing to share their technology and knowledge. Governments need to develop fair, balanced local content policies that create economic and educational opportunities for Africans without being overly restrictive or become a burden to foreign investors. Removing obstacles across the production and supply chain, including excessive taxes and red tape, and offering better fiscal terms, will help deepen collaboration, partnership and investment.

The adoption of technological developments is also essential. This is the time to invest and explore innovative solutions in order to participate in, and contribute to, reshaping the energy and infrastructure sectors across the continent. This will lead to efficient operations, profit increases and a boost to economic growth within communities.

Across much of the continent, there is a diverse array of opportunities in the oil and gas value chain. Despite coronavirus, experts are predicting a rise in mega gas finds and offshore exploration, as well as the development of gas-to-gas power initiatives, refining potential and trans-continental pipelines.

The ability to execute across the entire value chain requires good governance and will remain the biggest challenge to the development of Africa's energy market. It is vital that the continent's aspiring emerging economies embrace true structural reform to unlock growth and stable, consistent policies are in place driven by strong political will.

Oil and gas companies are notoriously risk-averse following the oil price dive, but to reset and prepare for the future, they must map out a strategic direction to thrive post-crisis.

Providing fair and equitable access to vaccines will be key to managing the health and economic repercussions of the COVID-19 pandemic. In October, the World Bank announced a US$12bn fund for low-income countries to finance the purchase and distribution of COVID-19 vaccines, tests, and treatments for their citizens. This should help many sub-Saharan African countries move towards a resilient recovery.

African countries must engage in robust, innovative actions to strengthen energy security and manage abundant natural resources to rebuild faster post-COVID. Scaling up infrastructure investment, technological developments and forging strong partnerships through a speedy implementation of the African Continental Free Trade Area will help to revitalise the energy sector and Africa's economic transformation.

PUTTING THE FOCUS ON LOCAL CONTENT

Richard Clay, Africa business development director at global workforce solutions provider Airswift, discusses the outlook for manpower and outsourcing in Africa's oil and gas industry.

2020 HAS BEEN a challenging year for the oil industry everywhere, Africa being no exception. However, Richard Clay, Africa business development director at Airswift, said that the company, which has a long history of involvement in Africa, has fared relatively well in the continent compared with other regions, with projects underway and operational continuing to move forward. The main impact of the pandemic has related to travel restrictions rather than the demand for personnel, he said.

"While projects that were pre-FID have been delayed or shelved, we hope that when the situation normalises, those projects will then go forward."

Oil and gas is the largest area of business for Airswift in Africa, where its main activities comprise sourcing for the traditional contractor workforce on a project basis, Africa being very capital project dependent.

"The largest part is contract hire, where specific skills need to be brought into the region to deliver a project, with the construction, commissioning and operations phases bringing the main demand for manpower," said Clay.

The other main area is global employment outsourcing and supporting the relocation of client staff members. This involves services such as finding accommodation, ensuring compliance with local employment regulations, ensuring taxes are paid etc. These services are in demand from supplier and service companies in particular, who require an entity and a license to be able to bid for work, and may need to be on the ground to conduct business development and preparatory work in advance of setting up a full entity.

Major projects Airswift has worked include Mozambique LNG, and Angola LNG project. It is the exclusive provider in Senegal and Mauritania to BP on the Tortue project and for Woodside on the Sangomar development offshore Senegal.

"If this project comes to FID, we should be doing a lot of work on that in the next few years," Clayton said.

Local content is a key element for Africa, Clay stressed. "We are supporting our clients in moving away from a focus on local content by percentage of headcount, to local content by skills transfer and developing the national workforce. That's something we've consulted on with governments in the region, and there are some good examples of where that works. Rather than employing a large number of low-skilled people, we try to encourage that long-term development of the workforce, which is in the project's favour as well. So if for example a project is set to reach the operations and maintenance phase in five years, a local workforce can be hired and trained for it in advance. It takes some foresight to make that initial investment."

Local content requirements vary from country to country, he adds, and can depend on the level of maturity of the industry. Requirements can be stricter n countries where the industry is more mature and where the capabilities of the local workforce have had time to develop. As well as local personnel requirement, there are also local ownership requirements in certain countries, he points out, with 50% local ownership required in Tanzania and 51% in Angola, for example.

"Tanzania's local content requirement legislation is well thought out, with varying levels of local content required, depending on the type of project and the phase the project has reached," he commented.

There are also different ways of implementing local content requirements. "In some countries the quota for local content will be based on a project as a whole, for example 5,000 national hires, or 30% nationalisation, with different levels applying to different elements of the project. In others, every company within the supply chain needs to meet the same local content requirements, from the supplier of parts to the main EPC, which can be quite challenging."

While there can be challenges dealing with new projects and new territories, "In Africa it's about ensuring you are compliant and following the rules," he said.

Turning to growth areas and trends, Clay highlights the rising number of LNG projects and the increasing demand for technical skills with the development of new technologies and the focus on efficiencies, as well as looking at different ways to construct projects, such as modular builds.

After a challenging year, Clay is optimistic about prospects going forward.

"The last couple of months have been incredibly busy, with huge number of bids and tenders and demands from new clients. There's a real energy and desire in the industry to catch up on commitments and delivery timescales after the disruption this year. We are confident that 2021 will be a busy year, with many projects set to be sanctioned, and those underway requiring a lot of hiring, particularly in East Africa," he concluded.

Airswift is global workforce solutions provider to the energy, process and infrastructure industries. For further information see the website at www.airswift.com

STRENGTHS OF GAS AND LNG INDUSTRIES

'Resilient', 'flexible' and 'optimistic' were the keywords from the Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC) 2020 panel which discussed the role of gas and LNG in the future energy mix. Robert Daniels reports.

MICHAEL STOPPARD, CHIEF strategist of Global Gas at IHS Markit, hosted the session and was joined by Fatima Al Nuaimi, CEO of ADNOC LNG; Meg Gentle, president and CEO of Tellurian; Niek den Hollander, CEO of Uniper Global Commodities; Mele Kyari, group managing director of Nigerian National Petroleum Corporation; Steve Hill, executive vice president at Shell Energy.

Stoppard began the session by observing that it had been striking how well the gas and LNG industries and markets had coped with 2020. The pandemic caused economic crises, extraordinary price volatility and financial hardships for companies, consumers and governments and yet the gas and LNG industries emerged strong.

The panelists echoed Stoppard's comments on this. Gentle pointed out that despite the turbulent year, LNG exports are already returning to pre-COVID levels and globally the market is set to grow by 2-3%. Following this, Hollanger noted that over the last couple of years the LNG market grew rapidly, and he expected it do so again over the next five years. Al Nuaimi suggested that the flexibility and cooperation that the industry showed, in actions such as changing cargo destinations and using shipping capacity to store LNG cargoes, were crucial to this. It has led to the emergence of a genuinely global LNG market which is very encouraging for the future of the industry.

The gas and LNG industries have dealt well with the pandemic.

Image Credit: Adobe Stock

While the short-term recovery has been good, and the long-term also looks positive, there could be problems in the mid-term. Hill ended his initial statement by identifying that final investment decisions (FIDs) for liquefaction projects were due to be made at a level of 50mn tonnes in 2020, but so far none have materialised.This will take time to replace and so the next couple of years are crucial for the industry as renewed investment is required to replace these FIDs and accelerate programmes going forward.

A shining light from the industry, to which each panelist gave credit, was the continued commitment to long-term environmental objectives. Despite suffering hardships this year, countries, companies and customers continued to emphasise the desire to reduce emissions. Already gas and LNG are seen as cleaner than other fossil fuels. Al Nuaimi explained how developed countries such as the UK, that have already made the switch to gas, have experienced a discernable change to their air quality. There has also been a sustained drive to reduce emissions in the production and transportation of gas and LNG within the industries.

Because of this, the panel recognised gas and LNG as key to the future energy mix which can supplement the transition to green energy over the next 20-30 years. LNG alone has the potential to reduce emissions by 1 gigatonne by 2050 largely due to its replacement of other fossil fuels. This means coal-heavy markets like China are of particular interest as they could switch to gas and LNG in pursuit of their carbon footprint initiatives. Gentle was keen to add here that India has committed US$60bn to its LNG industry so that by 2025 it has the potential to hold produce 70-100mn tonnes of LNG per year; currently 350mn tonnes is produced worldwide.

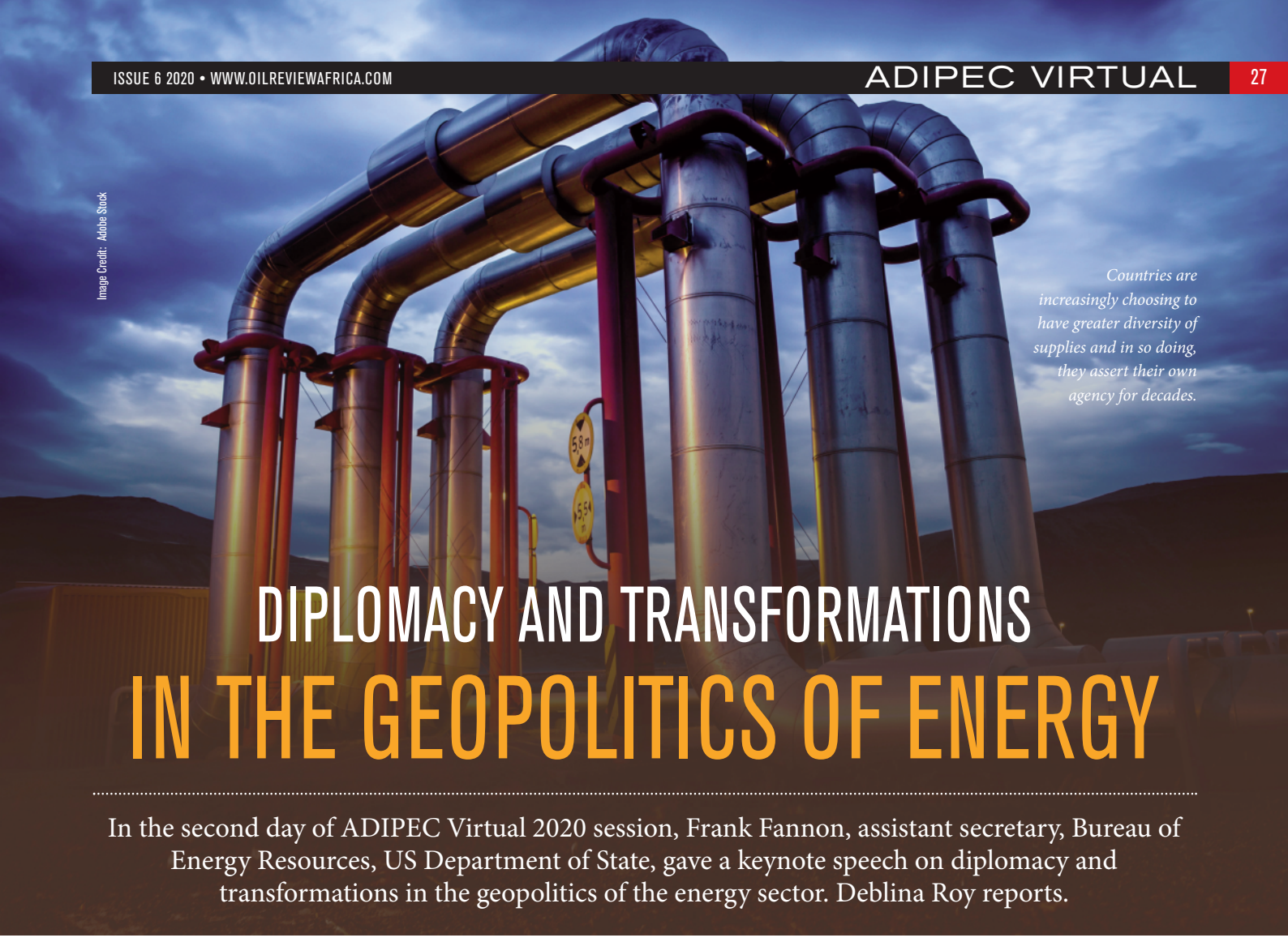


Image Credit: Adobe Stock

Countries are increasingly choosing to have greater diversity of supplies and in so doing, they assert their own agency for decades.

DIPLOMACY AND TRANSFORMATIONS IN THE GEOPOLITICS OF ENERGY

In the second day of ADIPEC Virtual 2020 session, Frank Fannon, assistant secretary, Bureau of Energy Resources, US Department of State, gave a keynote speech on diplomacy and transformations in the geopolitics of the energy sector. Deblina Roy reports.

THE KEYNOTE FOCUSED on the theme that the transformation of centres of energy production and consumption has helped to redesign the geopolitics of energy. This year's pandemic has affected global economies and shifted oil markets for the near future, reinforcing how international collaboration is key to ensure the resilience and stability of energy markets.

"The COVID-19 has thrown the world upside down and it is critically important that we move forward," said Fannon. The situation has created new opportunities and the transformation of the global energy map is showing how geopolitics of energy is getting shaped, how new supply and demand patterns affect statecraft and meeting calls for cleaner energy, as well as present both opportunities and challenges.

According to him, the energy represents an important factor in foreign policy. The relatively recent growth of the USA oil and gas production has materially transformed energy geopolitics in multiple ways. "From 2007-2019, the USA oil production increased more than 240%. This production afforded the USA greater foreign policy room to manoeuvre states that use their energy from our objectives and partnership with other producing nations, including the UAE."

"Energy partnerships can have a huge effect on other political or diplomatic areas. We've seen a similar effect with respect to the USA natural gas production. In 2016, when the USA started exporting LNG, we were the 15th biggest exporter in the world. Since then three years later in 2019, the USA was the third largest LNG exporter and we've shipped gas to almost 40 countries. As in the case of oil, US natural gas offers countries new options and indeed the foundation of a market.

"Countries are increasingly choosing to have greater diversity of supplies and in so doing, they assert their own agency for decades. The USA has joined Europe's ambition to have greater energy diversity. Today, US LNG exports are helping nations to achieve that ambition. For example, over the last two years, state department has assisted Croatia's plans to build an LNG terminal at Krk Island last month and the commercial operation is expected to start in January 2021. In Greece, we've supported the expansion of an existing gas infrastructure and the construction of a new LNG terminal."

"We see optimism and are developing regional energy markets. This drive toward regional energy markets is not particular to the Middle East and Southern Europe. It's a global phenomenon. The Indo-Pacific region will drive most of the world's energy demand growth through 2040 requiring trillions of dollars of investment. We are helping countries in the region to build free, fair and transparent energy markets, as well as develop their indigenous energy resources through Asia EDGE initiative. We've dedicated more than US$140mn in technical assistance to support energy security, diversification, access and trade across the Indo-Pacific region. We're working with Thailand and Vietnam where a major gas deal was just announced to strengthen gas sector governance.

"These new energy markets are positive developments that can improve geopolitical stability and promote a more prosperous world."

BUILDING RESILIENCE OF OIL AND GAS IN THE ENERGY TRANSITION

There are opportunities to maximise value in this tough environment, according to HE Dr Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology and Group CEO of ADNOC. The oil and gas industry has brighter days ahead and there is more value to be captured.

THE 36TH EDITION of the Abu Dhabi International Petroleum Exhibition Conference (ADIPEC) discussed the most pressing issues facing the energy sector, ranging from the post-COVID recovery goal as well as identifying increasing investment in clean energy technologies.

During his opening keynote address, His Excellency Dr Sultan Ahmed Al Jaber, the UAE Minister of Industry and Advanced Technology and Group CEO of the Abu Dhabi National Oil Company (ADNOC) emphasised the importance of the oil and gas industry in enabling economic development in the post-COVID recovery by ensuring a steady and reliable supply of energy to power growth. He highlighted the resilience of oil demand and stressed the need for the industry to balance caution with optimism, ensure business continuity and not lose sight of the long-term as we face the realities of a world turned inside out by the pandemic.

"For a start, we know the world will still need oil and gas when all of this is done. Even at the height of the lockdowns of March and April the world still consumed 75 mmbbl of oil per day. In fact, by our estimates, oil demand fell below 90 mmbbl of oil per day for only 12 weeks. So, we know the world still needs oil and gas. That is a fact," HE Dr Al Jaber said.

Image Credit: Adobe Stock

As the global oil and gas industry continues to experience rapid transformation, energy partnerships could have a "halo effect on political and diplomatic areas" across the world, said IEA's Dr Fatih Birol.

"We expect that oil demand will grow to over 105 mmbbl per day by 2030, and continue to supply over half the world's energy needs for many decades to come. At the same time, the petrochemicals sector will continue to grow at a healthy pace through and beyond 2050, in line with a steadily expanding global middle class. These are long-term positive trends and they highlight the central role that our industry can and should play in a post-COVID recovery," Dr. Al Jaber said.

> **"We expect that oil demand will grow to over 105mn bpd by 2030, and continue to supply over half the world's energy needs for many decades to come."**

"In the next 10 years, we will reduce our greenhouse gas intensity by a further 25%. We will expand our carbon capture programme so that it stores five million tonnes of CO_2 every single year. And importantly, we will explore the potential of new fuels, such as hydrogen."

'Energy partnerships have halo effect on politics and diplomacy'

According to Dr Fatih Birol, executive director of the International Energy Agency (IEA), as the global oil and gas industry continues to experience rapid transformation, energy partnerships could have a "halo effect on political and diplomatic areas" across the world. "In terms of global energy demand, we expect to see a decline this year of about 5%. To put this into context, this year's decline is seven times larger than the decline following the 2008/9 financial crisis," Birol said in a session.

However, he said that the IEA has identified increasing investment in clean energy technologies, which is on track to reach US$40bn this year and is changing the face of geopolitics in the energy sector.

"The one that is critical for me is carbon capture, utilisation and storage, which provides a very good bridge between energy realities and climate imperatives," said Birol.

AFRICAN RIG COUNT

COUNTRY	October 2019	November 2019	October 2020	November 2020
ALGERIA	43	39	24	29
ANGOLA	2	3	2	3
CAMEROON	2	2	1	1
CHAD	7	7	3	3
CONGO	2	2	0	0
CÔTE D'IVOIRE	0	0	0	0
EQUATORIAL GUINEA	1	1	0	0
GHANA	1	2	0	0
KENYA	7	5	3	3
LIBYA	16	16	8	12
MAURITANIA	0	1	0	0
MOROCCO	1	1	0	0
MOZAMBIQUE	0	1	0	0
NIGERIA	18	20	7	8

Source: Baker Hughes

New air sensor to make chemical plants safer

CHEMICAL PLANTS WILL become safer places to work with a reduced risk of injury, chronic respiratory ailments or even death, thanks to a new air sensor being developed to detect toxic and explosive solvents using photonics.

Scientists from the University of Navarra in Pamplona, Spain have teamed up with the EU photonics innovation hub ACTPHAST 4R to develop a demonstrator for their breakthrough optical sensing technology that detects lethal chemicals that are both dangerous to inhale and highly explosive.

This new detector uses optical fibres to monitor air quality, with no electrical or flammable components as part of the device. The optical fibre sensing solution is designed to be ideal for dangerous places where electricity is prohibited and could soon create safer working conditions for chemical plant staff who handle highly toxic and explosive chemicals.

The lead researcher on the project, Dr César Elosúa Aguado from the Electrical, Electronic Engineering and Communications Department Public at the University of Navarra, said,

"An air sensor using optical fibres for the purpose of VOC detection is a major scientific breakthrough concept. It is currently in its pre-prototype, 'demonstrator' phase but has the potential to be further developed for industrial application.

"The innovation support we have received from ACTPHAST 4R has been crucial to bridging the gap between the 'valley of death' in innovation and accelerated TRL advancement. ACTPHAST 4R has been essential in developing the cross-border connections to the expertise that we needed to go further."

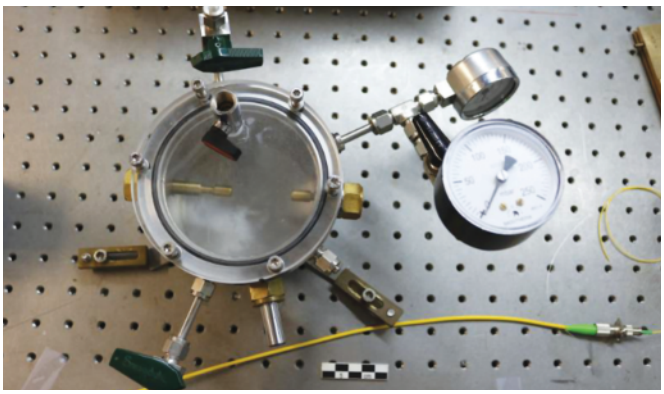


Image Credit: ACTPHAST 4R

This new detector uses optical fibres to monitor air quality, with no electrical or flammable components as part of the device.

If the demonstrator is successful, the researchers will look at commercialisation options such as licensing or a spin-out company from the university, to take it to the next stage of a working prototype and eventually a full commercial product.

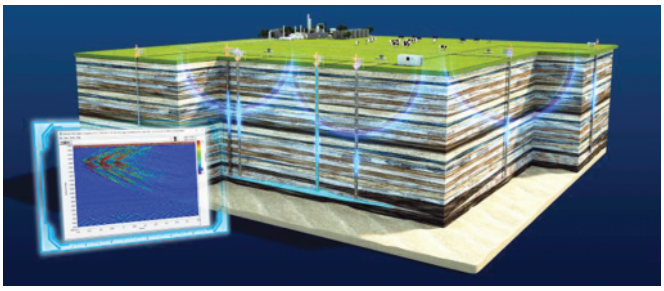
Silixa launches fibre-optic sensing-based monitoring solution

SILIXA HAS LAUNCHED Carina CarbonSecure, its distributed acoustic sensing (DAS)-based solution for continuous or on-demand monitoring of all stages of carbon capture and storage (CCS) operations.

The new solution offers offshore and on-land operators the necessary monitoring measures with a reduced cost and environmental impact of their CCS facilities. The solution enables operators to provide the assurance to regulators and communities necessary to expand CCS adoption worldwide.

Glynn Williams, CEO at Silixa, said, "CCS is a key component of the energy transition and plays an essential role in achieving international emissions targets. Studies from both the IPCC and the IEA recommend a renewed focus on CCS as the only proven technology that can be deployed at the scale needed to achieve essential climate goals. That is why we are launching Carina CarbonSecure: to enable the low-cost, reliable, and exceptionally accurate monitoring capability that is crucial to the take-up of CCS."

Image Credit: Adobe Stock



The system includes 3D vertical seismic profiling (VSP), time-lapse seismic, well integrity and leak detection.

Carina CarbonSecure delivers ultra-high resolution, densely sampled acoustic data for real-time continuous and/or on-demand monitoring. Elements of the solution include microseismic monitoring and passive seismic throughout the lifetime of a CO_2 storage facility.

CORTEC launches CX-HB3.0 hydra-balance choke and panel system

CORTEC, MANUFACTURER OF high-quality API valves, has launched CX-HB3.0 Hydra-Balance Choke and Panel System, which offers drilling operations an increased level of value and functionality within managed pressure drilling (MPD), underbalanced drilling (UBD) and other drilling set point applications.

Image Credit: CORTEC

The system aims to deliver highly precise set point control in a simple, user-friendly package that minimises operational costs.

The system, which is API 6A and NACE MR0175 compliant, is a hydraulic dual choke unit and can be controlled via a compact remote panel that can be installed in close proximity to the driller. This new system has been designed to provide higher levels of accuracy, ease of use and field-friendly serviceability for end users seeking a simple set point solution. The Hydra-Balance system is designed to exceed the level of response and precision of many existing options within the market today. CORTEC has concluded an extensive round of both in-house validation and in-field operational trials. The initial run of production units will be available in the first quarter of 2021 with negotiable rental package options.

The CX-HB3.0 system features a main HPU/HMI control panel with remote HMI panel integration and offers a set point accuracy of +/- 25 or less PSI, operating pressure range up to 2,500 PSI, while maintaining a compact footprint that maximises weight and space savings.

Olympus to inspect complex piping systems

GLOBAL TECHNOLOGY LEADER Olympus has launched IPLEX GAir long videoscope solution to inspect complex piping systems.

The interior of pipelines that carry hazardous material are inspected for corrosion and other defects using videoscopes. Long, complex piping is especially difficult to navigate and inspect because of complex bends and potential obstructions. The IPLEX GAir long scope solution solves these challenges with a combination of pneumatic articulation that enables maneuverability at distances up to 30 metres with outstanding image quality.

To reach the inspection target quickly, the videoscope's unique guide head enables it to slide easily through pipe joints while pneumatic articulation provides fine control, even when the 30 metres insertion tube is fully extended.

The videoscope's advanced image sensor and image processing software provide clear wide-view images that enable users to see more in a single view. For an even wider view, an optional 220-degree fish-eye optical tip adaptor is available to show both the pipe's side wall and forward view at the same time.

For dangerous or hazardous inspections, such as inside nuclear power plants, users can set up the videoscope and control it from a safer location up to 100 metres away. The videoscope's touch screen can be detached from the main unit and positioned up to five metres, while wireless capabilities make it easy to share screen images with colleagues.

Schlumberger introduces StrataBlade bit and TruLink service

SMITH BITS, A Schlumberger company, has introduced the StrataBlade concave diamond element bit that improves the rate of penetration (ROP) in a wide range of rock types, while withstanding impact damage often associated with drilling interbedded formations.

"The StrataBlade bit is the latest addition to our three-dimensional cutting elements portfolio, which expands our holistic drilling solutions offering and enables operators to enhance overall drilling performance in challenging formations," said Jesus Lamas, president, well construction, Schlumberger.

The StrataBlade bit incorporates new geometry Strata concave diamond elements across the bit face, which increases cutting efficiency and results in higher instantaneous ROP with the same operating parameters. In deep lateral wells where weight transfer to the bit is a challenge, the StrataBlade bit drills with higher ROP when compared with traditional PDC bits with flat cutters.

Schlumberger has introduced the TruLink definitive dynamic survey-while-drilling service to help operators to enhance end-to-end well construction operations. "TruLink service advances well construction operations and improves overall drilling performance through its unique, industry-first ability to perform measurement-while-drilling surveys on bottom without stopping drilling operations," said Lamas.

Saipem invests in new simulator technology

FOLLOWING A SIGNIFICANT seven-figure investment, Saipem has expanded its Saudi Arabian training facility in Dammam by installing simulator technology to boost skills and competency across its workforce.

The new DS:5000 drilling simulator, developed by Drilling Systems, has been procured for the site. With both conventional rig floor and cyber chair functionality, it features the very latest 3D graphics and modelling software to create a realistic representation of rig floor operations, which results in an immersive learning environment.

The simulator technology can be programmed with well-specific conditions and various scenarios allowing Saipem's personnel to simulate and practise advanced drilling operations such as well control, stuck pipe, jarring and managed pressure drilling in a safe and controlled environment.

Image Credit: Drilling Systems

The DS:5000 drilling simulator creates a realistic learning environment for training.

As well as training for all drilling operations, tripping practices and well control, the simulator will be heavily utilised in the delivery of IADC and IWCF accredited well control courses.

The new simulator will form the foundation of training for all drilling personnel and will be used to train and assess assistant drillers, drillers, tour pushers, tool pushers and supervisory and management staff.

ZALUX launches new ATEX lighting portfolio for oil and gas

EUROPEAN MANUFACTURER ZALUX has launched its new ATEX luminaires catalogue, with high-quality lighting solutions for explosive atmospheres.

In hazardous areas, product safety is fundamental to protect workers during operation and also in its installation and maintenance. With these needs in mind, ZALUX has developed the new STRONGEX 2, whose robustness is one of the greatest of the ATEX lighting market thanks to its outstanding IP69K resistance.

It is suitable for outdoor, even in offshore and chlorinated atmospheres or where there are ammonia or sulphur vapours, thanks to its high chemical resistance and IK10 impact protection, and has a wide operation range from -35ºC to +55ºC.

Image Credit: ZALUX

ZALUX ATEX lighting portfolio includes luminaires to cover a wide range of needs.

Its reliability, combined with a great lighting quality, offers high energy efficiency. Luminaires can be wireless dimmed and controlled via Low Energy Bluetooth. When combined with presence and daylight sensors, light use is optimised, increasing luminaire lifetime and allowing savings of up to 70% in the electricity bill.

DNV GL launches recommended practice to build quality-assured digital twins

DNV GL HAS published the oil and gas industry's first recommended practice (RP) for building assured digital twins. Developed in collaboration with TechnipFMC, DNVGL-RP-A204 sets a benchmark for the sector's varying approaches to building and operating the technology.

It guides industry professionals by assessing whether a digital twin will deliver to stakeholders' expectations, from the inception of a project, to establishing confidence in the data, assessing the computational models that a digital twin runs on, and evaluating an organisation's readiness to work with and evolve alongside a digital twin.

According to Gartner, 75% of organisations implementing Internet of Things (IoT) already use or plan to use digital twins within a year.

Image Credit: DNV GL

DNV GL's RP introduces a contractual reference between suppliers and users./Still image from digital twin movie produced by Digital Solutions.

DNV GL's RP introduces a contractual reference between suppliers and users, and acts as a framework for verification and validation of the technology. It builds upon the principles of DNV GL's recommended practices for the qualification of novel hardware technology and assurance of data and data-driven models.

The methodology behind DNV GL's new RP has been piloted on 10 projects with companies such as Aker BP, Kongsberg Digital and NOV Offshore Cranes.

KENC launches automatic boat landing systems

KENC ENGINEERING HAS launched two new automatic boat landing systems (ABLS), ABLS V- Type and ABLS H-Type, to provide a safe transfer between a CTV and large vessels. The product launch is a follow-up on a delivery last year by KENC of a 13-metre boat landing system for Van Oord.

The ABLS has a robust and compact design, that comes fully automated with an easy-to-operate control system and equipped with hydraulic drives. It is now available in two configurations and can be upgraded with features such as an integration with board systems, luggage lifting system and flood lights, among others. The base configuration of both ABLS systems are certified and compatible with all common CTVs.

Image Credit: KENC Engineering

ABLS comes fully equipped with an automated control system and hydraulic drives.

Eric Buining, managing director at KENC, said, "The main advantage of KENC's ABLS is that there is no crane handling needed to deploy and retrieve the boat landing system.This results in more uptime and less risk."

"The H-Type is a proven system with low storage height and suited for larger vessels, where the V-Type has an incredibly small footprint with simple and straight forward vessel interfaces," said engineering manager Cor Hilbrink.

Total commits to Oil & Gas Methane Partnership 2.0

TOTAL HAS JOINED the second phase of the Oil & Gas Methane Partnership (OGMP 2.0) which was launched by the United Nations Environment Programme in 2014.

The initiative brings together industrial companies, governments and NGOs to monitor and report methane emissions to reduce them.

The second phase of the partnership aims to define a broader methane reporting framework, which extends to the entire gas value chain and to non-operated assets. Total addresses the various sources of methane, such as flaring, venting and fugitive emissions, by following strict design standards for its new projects and committed to zero routine flaring by 2030.

The Group has an extensive research programme to develop emission measurement technologies with fixed camera, drones or satellites and has established a specific dedicated testing site in the south of France for such technologies (TADI – Total Anomaly Detection Initiatives).

The Group also takes position on public policies when relevant, as in 2019 when it publicly voiced its opposition to the rollback of methane regulations in the United States.

Patrick Pouyanné, chairman and CEO of Total, said, "Our performance is amongst the industry's best as we have already cut methane emissions by 45% since 2010. And in order to progress further on monitoring, Total invests in cutting-edge R&D programmes to support the development of future detection and measurement technologies."

OleumTech releases two flow totalizer models to its H Series line of hardwired instrumentation solutions

OLEUMTECH, A LEADING provider of industrial automation and IoT solutions, has released two new flow totalizer models to its H Series line of hardwired instrumentation.

In addition to the existing Wireless Flow Totalizer version available on the OTC Platform, OleumTech now offers the Standalone Local Read version and the RS485 Modbus version on its H Series Platform, providing customers with the perfect option, regardless of their preference for local or remote flow measurement information.

The OleumTech Flow Totalizers easily connect to third-party turbine flow meters and deliver highly accurate flow rate and accumulated volume measurements. Users can easily configure devices using the LCD push-button interface while also gaining instant access to flow data that includes instant flow rates, current totals, previous totals, and other critical data points.

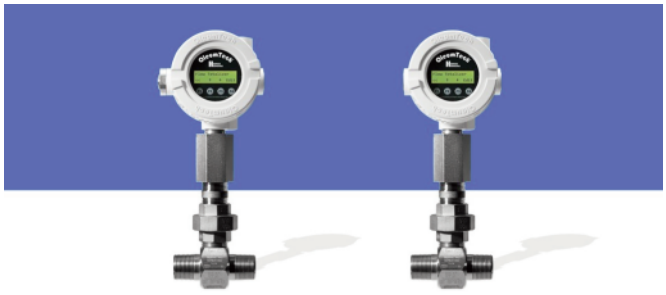


Image Credit: OleumTech

The OleumTech Flow Totalizers easily connect to third-party turbine flow meters.

"We are excited to add these two new Flow Totalizers to our growing portfolio of Hardwired Instrumentation. These H Series Flow Totalizers are feature-rich, highly stable, accurate, and offer a price point unrivalled by our competitors. I am proud of our world-class design and development team at OleumTech as our innovation continues to deliver throughout these very challenging market conditions," said Vrej Isa, chief operating officer.

HS1000-FT1 (Local Read) and HW5000-FT1 (RS485 Modbus) Flow Totalizers are intrinsically safe and certified for use in hazardous locations in Class I Division 1 (Zone 0).

ADVERTISER'S INDEX

MWANANCHI GAS PROJECT: WHAT IT MEANS FOR KENYA

In Kenya, the Mwananchi Gas Project project is thought to have collapsed on alleged corruption, lack of funding and supply at the initial phases. However, it is hoped that the government has sealed the loopholes and has taken appropriate measures to effectively roll out the ambitious LPG project again.

PAVEL OIMEKE, **ENERGY** and Petroleum Regulatory Authority (EPRA) director-general, stated that the per capita consumption of liquefied petroleum gas (LPG) in Kenya had increased from 2.2 kilogrammes in 2013 to 6.4 kilogrammes last year, as reported in the *Daily Nation*.

This has indeed created a demand for an effective gas plan in the country, and cooking gas consumers are also waiting for the government to take necessary steps to revive the affordable cooking gas programme which collapsed in 2018.

As reported in the website of the National Oil Corporation (NOC) of Kenya website, the government of Kenya is working with the Ministry of Petroleum & Mining through National Oil Corporation to roll out this national LPG enhancement project. The Mwananchi Gas Project is set to produce cheap cooking gas in 13- and six-kilogramme cylinders. Additionally, apart from the programme, NOC Kenya aims to develop a distribution model to enable the citizens of Kenya to access LPG at the nearest shopping centres through licensed distributors.

The project is thought to have collapsed on alleged corruption, lack of funding and supply of defective cylinders that caused safety risks to the users during the starting phases. However, it is hoped that the government has sealed the loopholes and taken appropriate measure for the effective roll-out of the ambitious project again.

Image Credit: Adobe Stock

NOC Kenya aims to develop a distribution model to enable the citizens to access LPG at the nearest shopping centres. through licensed distributors.

> **"The gas project aims to ensure the availability of clean fuel to Kenyan citizens, thus increasing their quality of life."**

In February 2020, *People Daily Kenya* reported that a tender was floated to be awarded in 150 days to supply valves and fittings for the gas project. Once fully rolled out, the ambitious project is set to accelerate LPG penetration to 70% within the next three years. Additionally, the project can be proved beneficial for Kenyan citizens as it may reduce respiratory diseases linked with household air pollution caused due to the sustained use of firewood and charcoal.

According to NOC Kenya, some of the other benefits of the Mwananchi Gas Project include:

- Ensuring the availability of clean fuel to a majority of Kenyan citizens, thus increasing their quality of life.
- Eliminating deforestation by reducing the use of charcoal and firewood.
- Empowering women, youths and people living with disability by encouraging them to be an essential part of the supply chain as distributors, retailers as well as brand ambassadors.

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