

# Oil Review

Oil · Gas · Petrochemicals

## Africa

VOLUME 16 | ISSUE 5 2021



## Local content in sub-Saharan Africa

Mozambique: Positive outlook for global investors

Role of satellites in difficult-to-reach areas

Fire prevention, Asset integrity, Sand management,  
Commodity Trade Risk Management to achieve a  
lower carbon economy



*A snapshot on what to expect  
in Africa Oil Week (p6)*

# Building Africa's world-class projects

## Dangote Petroleum Refinery

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- 500 KTPA Polyethylene Plant.





Localisation strategies have been successful in developing nationally-associated industries. (Image credit: ChampionX)

**Editor: Deblina Roy**

✉ [deblina.roy@alaincharles.com](mailto:deblina.roy@alaincharles.com)

**Editorial and Design team:** Mariam Ahmad, Prashanth AP Fyna Ashwath, Miriam Brtkova, Praveen CP, Robert Daniels, Matthew Hayhoe, Manojkumar K, Lucia Mathurin, Unique Pattnaik, Tulana Nayak, Prince Kariappa, Rahul Puthenveedu and Louise Waters

**Publisher:** Nick Fordham

**Sales Manager:** Richard Rozelaar  
E-mail: [richard.rozelaar@alaincharles.com](mailto:richard.rozelaar@alaincharles.com)

**Publication Manager:** Roman Zinchenko  
Tel: +44 (0) 20 7834 7676 Fax: +44 (0) 20 7973 0076  
E-mail: [roman.zinchenko@alaincharles.com](mailto:roman.zinchenko@alaincharles.com)

**International Representatives**

India	Tanmay Mishra
Nigeria	Bola Olowo
UAE	Murshid Mustafa
USA	Michael Tomashelsky

**Head Office:**

Alain Charles Publishing Ltd  
University House, 11-13 Lower Grosvenor Place,  
London SW1W 0EX, United Kingdom  
Tel: +44 (0) 20 7834 7676 Fax: +44 (0) 20 7973 0076

**Middle East Regional Office:**

Alain Charles Middle East FZ-LLC  
Office L2-112, Loft Office 2, Entrance B  
P.O. Box 502207, Dubai Media City, UAE  
Tel: +971 4 448 9260 Fax: +971 4 448 9261

**Production:** Srinidhi Chikkars, Dinesh Dhayalan and Eugenia Nelly Mendes  
E-mail: [production@alaincharles.com](mailto:production@alaincharles.com)

**Subscriptions:** [circulation@alaincharles.com](mailto:circulation@alaincharles.com)

**Chairman:** Derek Fordham

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## EDITOR'S NOTE

IN THIS ISSUE, the focus is on the practice of localisation in key oil and gas markets (p8). Whether stipulating a specific percentage of the workforce, influx of new exploration fields, or sub-Saharan Africa's promising natural gas supply chain, manufacturing work and raw materials must be sourced locally to build a sustainable long-term economy.

We've also got an update on the outlook for Ghana (p10). Despite the pandemic, the country has seen some major developments in 2021. It's a genuinely inspiring story – and not over yet. Artificial lift, flare gas technologies and the role of satellites in O&G will bring new and diverse technological advancements for the industry. The next few years could be even more exciting.

Meanwhile, we look forward to Africa Oil Week, which will be held for the first and only time in Dubai. Oil Review Africa is delighted to be a media partner for this event, and we look forward to providing updates from new and established markets.

**Deblina Roy**

Editor, Oil Review Africa

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# Executives Calendar 2021

## NOVEMBER

**8-11 Africa Oil Week**  
Dubai, UAE  
[www.africa-oilweek.com](http://www.africa-oilweek.com)

**9-12 African Energy Week**  
Cape Town, South Africa  
[www.aew2021.com](http://www.aew2021.com)

**15-17 Africa Energy Forum**  
London, UK  
[www.africa-energy-forum.com](http://www.africa-energy-forum.com)

**15-18 ADIPEC**  
Abu Dhabi, UAE  
[www.adipec.com](http://www.adipec.com)

**17-19 East Africa Oil & Gas Summit & Exhibition**  
Virtual  
<https://eaogs.com/en>

**23-25 Angola Oil & Gas Technology and Services Conference**  
Luanda, Angola and Virtual  
<https://angola-series.com/>

## DECEMBER

**7-9 Mauritanides 2021**  
Nouakchott, Mauritania  
[www.mauritanidesmr.com](http://www.mauritanidesmr.com)

**9-10 U.S.-Africa Energy Forum**  
Houston, Texas  
<https://energycapitalpower.com/event/us-africa-energy-forum/>

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

## Spotlight on Mauritania's mining, oil and gas at Mauritanides 2021

MAURITANIDES, THE REGION'S largest international mining and energy conference and exhibition held since 2010 and supported by the Mauritanian Ministry of Petroleum, Mines and Energy, is all set to be held from 7-9 December 2021 in Nouakchott, Mauritania.

The event has separate two-days conference, with free-to-attend exhibition, hosting the world's leading mining and technology providers and post conference site-tours.

More than 1,600 attendees converged in Nouakchott in 2018 for this flagship showcase, which is a major fixture in the global mining and energy trade event calendar. Mauritanides 2021 will continue to shine the spotlight on Mauritania's vast minerals and energy wealth, with a strong core representation from Mauritanian companies and SMEs.

The event is a gathering of top mining and hydrocarbons executives, representatives of regional executive authorities, investors, banks, industry



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Nouakchott, Mauritania

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[www.mauritanidesmr.com](http://www.mauritanidesmr.com)

*The event is the foremost West African forum for the global mining and energy stakeholders.*

Image Credit: Mauritanides

associations, service companies and equipment producers for three days of networking, knowledge sharing and business matching in Mauritania.

This event is supported at the highest level by the Mauritania government and key government leaders including the President, Prime Minister and Minister for

Petroleum, Mines and Energy graced the 2018 edition.

Find more information at [www.mauritanidesmr.com](http://www.mauritanidesmr.com)

## TMC to supply compressors for Senegal FPSO

NORWAY-HEADQUARTERED TMC Compressors has won a contract to supply the marine compressed air system for the Woodside Sangomar FPSO, offshore Senegal.

Under the terms of the agreement, TMC will deliver a large marine compressed air system to Woodside Sangomar FPSO which is currently undergoing conversion from a very large crude carrier (VLCC) to a floating, production, storage and offloading vessel (FPSO) at COSCO shipyard in Dalian, China. The marine compressed air system will be manufactured in Europe and delivered to the shipyard.

“The Sangomar field is expected to be Senegal’s first offshore oil development. I believe any supplier would be proud to be involved with such an important project for a developing nation,” said Hans Petter Tanum, TMC’s director of sales and business development.

Once completed, the FPSO will be deployed at the Sangomar (formerly SNE) field located around 100 km south of Dakar, Senegal. MODEC is responsible for supplying the FPSO, while Woodside is the operator of the Sangomar field development.

Scheduled for delivery in early 2023, the FPSO will be permanently moored at a water depth of approximately 780 m. It will be capable of processing 100,000 barrels of crude oil per day, 130 million scf of gas per day, 145,000 barrels of water injection per day and will have minimum storage capacity of 1,300,000 barrels of crude oil.

## European IOCs hold largest volumes of unsanctioned reserves in sub-Saharan Africa

MANY INTERNATIONAL OIL and gas companies (IOCs) are holding on to vast unsanctioned reserves in sub-Saharan Africa, along with large numbers of discoveries, with no semblance of associated development plans, according to data and analytics company GlobalData.

With strategies leaning towards a lower carbon future and a shift away from high-risk investments, resources that no longer fit this narrative risk being left behind by the IOCs currently holding them.

Conor Ward, oil and gas analyst at GlobalData, commented, “The top five companies in the region with the largest volumes of unsanctioned reserves are all major IOCs, with TotalEnergies sitting at the top of the pack and four out of five



Image Credit: Adobe Stock

IOCs are holding on to vast unsanctioned reserves in sub-Saharan Africa.

being European IOCs.

“Much of TotalEnergies’ unsanctioned reserves in the region come from the Prosperidade gas/ condensate development in Mozambique where final investment decision (FID) has been delayed many times already.”

Ward added that more than

80% of the unsanctioned reserves in projects across sub-Saharan Africa come from natural gas, historically considered to be uneconomic in the region; however, the growth of LNG demand and LNG export infrastructure provides opportunity for commercialising gas in the region.

## Sercel awarded major seismic equipment contract in North Africa

CGG HAS ANNOUNCED the award to Sercel of a major contract to supply land seismic equipment for a 3D mega-crew survey in North Africa. It includes a 508XT acquisition system with 100,000 QuietSeis®

digital sensors and a fleet of twenty Nomad 90 Neo broadband vibrator trucks. The equipment is expected to be delivered in Q4 2021.

The addition of these 100,000 digital sensors confirms the

increasing industry enthusiasm for low-noise and high-accuracy sensor technology. QuietSeis leads this field and is fully capable of meeting the industry’s expectations for true broadband seismic.

Emmanuelle Dubu, Sercel CEO, said, “We are grateful to all our customers who have placed their trust in our state-of-the-art solutions, and we are proud to accompany them in what is truly a paradigm shift in generating, recording and managing the data required for precision imaging. This is perfectly illustrated by this new award: the combination of the QuietSeis digital MEMS sensor and the Nomad 90 Neo vibrator source is the winning combination for 21st century broadband seismic.”



Image Credit: Sercel

Sercel Nomad 90 Neo super-heavy broadband vibrator.

# A GATEWAY OF OPPORTUNITY FOR AFRICA AND MIDDLE EAST

Africa Oil Week (AOW), the leading oil and gas show for Africa is scheduled to host its 27th edition in Dubai from 8-11 November 2021 at Madinat Jumeirah. Owing to the organisers' emphasis on the safety and wellbeing of attendees, the event will be held for the first and only time in the Emirate.

**D**ESPITE THE TEMPORARY change in location from Cape Town to Dubai, AOW will continue to stimulate upstream deals and transactions, drive investments into African projects, and facilitate new partnerships and networking opportunities for the African upstream. The event presents a chance to be a bridge between Africa and the Middle East, showcasing the immense potential in the African market.

Around 66% of African governments, including ministers from Ghana, Uganda, Senegal, Côte d'Ivoire, Kenya and the Democratic Republic of the Congo, are set to be represented. More than 24 National Energy Showcases will be hosted throughout the week, providing a dedicated investment platform for ministers, NOCs, utilities and regulators to broker deals and meet new partners.

## Capitalising on Dubai's oil and gas market

Reuniting the industry under the *Succeeding in a Changed Market* theme, Africa Oil Week will bring together the thought-leaders across industry and government representatives who will reshape the future of oil and gas in Africa.

Hon. Matthew Opoku Prempeh, minister of energy, Republic of Ghana, said, "This year, we are thrilled that the event will take Africa to the Middle East.



*The event has received overwhelming support from leading oil, gas and energy organisations from across the globe.*

This will help us showcase our competencies. We want to laud the efforts taken by the organisers, who have ensured that patrons don't miss out on a valuable industry event like AOW, all this while, following the necessary Covid-19 safety protocol."

Paul Sinclair, vice-president of energy and director of government relations, Africa Oil Week and Future Energy Series Africa, said, "As we gear up for AOW in Dubai, we aim to offer a once-in-a-lifetime experience to all our event attendees who are flying in from around the globe.

Our primary aim is to capitalise on the top-notch event organising capabilities of the Emirate, a thriving hub for oil and gas, while helping attendees discover the potential of business opportunities in Africa.

As part of its agenda, the event will host the Future Energy Series: Africa symposium, welcoming energy ministers and the private renewable and power sector for progressive dialogue on driving green economies and ensuring universal and sustainable power access for the continent.

Another initiative, the Africa

Independents Forum, will present active assets, drilling campaign updates and JV opportunities across the continent. It will feature presentations from organisations including ReconAfrica, FIRST E&P, Heritage Oil and Africa Oil Corp.

Additionally, Africa Oil Week and partner Lean In Energy (LIEN) will host the *AOW Accelerates: Diversity & Inclusion* initiative to explore the role of diversity within Africa's energy transition. ♦

[www.Africa-OilWeek.com](http://www.Africa-OilWeek.com)

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# DRIVING SUSTAINABILITY THROUGH LOCAL CONTENT STRATEGIES

Lionel Israel, business manager – sub-Saharan Africa, ChampionX, discusses how localisation strategies have been successful in developing nationally-associated industries, particularly within the natural gas supply chain.

**L**OCAL CONTENT IS a long-established practice commonly adopted across global energy hubs, which ensure the development of local skills, technology and manufacturing capabilities. Often imposed by in-country governments, the regulations focus on the transfer of knowledge and skills to build a sustainable long-term industry.

The practice of local content can vary from country to country, but it often stipulates that specific percentages of the workforce, manufacturing work and raw materials must be sourced locally. While economic advantages, such as employment, remain high on government agendas, recent years have seen a shift in attitude with the sustainability advantages that local content offers now being realised.

Over the last decade, most of the world's biggest oil and gas discoveries have been on the African continent, including Chevron's Mafumeira Sul project offshore Angola and Shell's Bonga field off the coast of Nigeria. With this influx of new exploration fields, ambitious local content policies are ensuring resources serve African economies. In sub-Saharan Africa, for instance, recent localisation strategies have been successful in developing nationally-associated industries, particularly within the natural gas supply chain. However, the advantages these policies deliver towards sustainability and climate action goals are rarely discussed.

The effects of climate change are clear on the African continent, with five of the countries most affected by extreme weather events in 2019 located in Africa, according to the Global Climate Risk Index produced by Germanwatch. Africa has made great efforts in driving the global climate agenda. This is demonstrated by the very high levels of



Image Credit: ChampionX

*Local content can support ambitious environmental targets.*

ratification of the Paris Agreement – over 90% – and many African nations have committed to transitioning to green energy within a relatively short time frame. New renewable energy projects from Kenya to South Africa will also help balance out Africa's energy matrix as it expands its electrification rates to reach every corner of the continent.

Environmental targets have never been higher on the oil and gas industry's agenda. But how does local content support these ambitious goals? There are a number of elements which are crucial to oil and gas leaders, innovators and decision-makers, working closely with their local workforces to build a more energy-efficient future. Local content is a vital player in this ambition.

First, it is important to identify how local content and sourcing can impact carbon

footprint. Calculating each carbon footprint provides transparency and clarity to customers. To assess its total impact, a product's bearing on production, processes and employment are still important, but the sustainable benefits local content can deliver should also be factored in.

In the instance of production chemicals, in many cases the use of these products has a positive impact on reducing energy usage. For example, the use of emulsion breakers reduces the need for heat consumption and minimises mechanical processes, which in turn, translates to a decline in CO<sub>2</sub> emissions. Likewise, highly active H<sub>2</sub>S scavengers can be used to reduce the amount of chemicals required, delivering a safer, more sustainable and efficient solution.

This step-by-step carbon-counting journey is now more commonly requested by operators as businesses look to gain a greater understanding of their impact on the environment. Recognising this demand, ChampionX Corporation (CHX) has acquired Scientific Aviation Inc, a provider in methane emissions detection, to help support the industry's carbon reduction goals.

Production chemical solvents can account for as much as 80% of chemical formulations. If these products are developed and imported from other regions, the final product has a significantly higher carbon footprint when compared to locally blended solvents, which utilise national workforces and local facilities. Local content is playing a significant role in achieving individual sustainability goals, reducing project costs and allowing businesses to be less reliant on emission-heavy air travel required for expats flying into country.

Traditionally, the development of local content in sub-Saharan Africa has been framed around operator requirements. For companies

in the chemical solutions sector, local blending was often preferred, as opposed to importing products. Prior to 2015, there was a customised approach for each client, with every operator requesting installation of blending units close to their operational bases. This resulted in a high cost per unit, but with soaring oil prices to match, this wasn't an issue.

However, when the oil crash hit in 2015, business drivers took a dramatic shift, and unit costs were closely scrutinised. Companies operating in the region had to re-evaluate and, as a result, many in-country bases were consolidated. During this time, importing raw materials for local blending became more common practice for companies with an existing local footprint, such as ChampionX Químicos Lda. Delivering locally blended, concentrated chemical solutions, which required fewer unit volumes to match performance, reduced both logistics costs and carbon footprint.

Today, investors are increasingly making decisions based on environmental, social and



Image Credit: ChampionX

According to Israel, the development of local content in sub-Saharan Africa has been framed around operator requirements.

governance (ESG) ratings that assess, among other things, sustainability performance and responsible operations. As a result, there has been a significant transfer of investment from companies with poor, or no ESG ratings, to those with a more attractive standing. Companies with favourable ESG ratings typically create increased value for their shareholders compared to their peers. At its simplest, a sustainability focus is about identifying and mitigating risks that are made more transparent when the business is viewed through ESG lenses. So, where does local content fit into this?

As the world continues to accelerate towards a net-zero future, it is vital that we adapt to this 'new norm' and respond to the evolving landscape. This means businesses must view their activities at all stages of the product lifecycle through a sustainability lens. Local content is a key driver in achieving a more sustainable, low-carbon energy industry and it is vital that a strategy is adopted early to fully realise the benefits this can deliver. ♦

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# A PROMISING FUTURE FOR GHANA

Ghana is well-placed to be a major player in sub-Saharan Africa's gas industry, with major progress being made in the Jubilee field. Overall, it is promising news for a country which is seeking to accelerate oil and gas exploration by acquiring and developing assets.

**T**HE YEAR 2021 has seen some major developments in Ghana's oil and gas sector. The country is taking the initiative to have sufficient capacity to meet almost the entirety of the country's demand for fuel.

Eni announced a major oil discovery on the Eban exploration prospect in CTP Block 4, located approximately 50 km off the Ghanaian coast and about eight km northwest of Sankofa Hub, where the John Agyekum Kufuor FPSO is located. The estimated hydrocarbons in place between the Sankofa field and the Eban-Akoma complex are now in excess of 1.1 bboe, and further oil in place upside could be confirmed with an additional appraisal well.

In addition to this, TechnipFMC's integrated engineering, procurement, construction and installation (iEPCI) contract for the Jubilee South East development covers the supply and offshore installation of all major subsea equipment, including manifolds and associated controls, flexible risers and flowlines, umbilicals and subsea structures. This is TechnipFMC's first iEPCI project with Tullow Ghana Ltd. Tullow Oil plc started a multi-year, multi-well drilling campaign offshore Ghana with the commencement of drilling of the first well at the Jubilee Field.

Jonathan Landes, president of



*Ghana is showing positive developments in the oil and gas sector.*

Image Credit: Adobe Stock

subsea at TechnipFMC, has expressed optimism in Ghana's offshore development saying, "We will continue to use our subsea studio digital solution to optimise the development, execution and operation of Jubilee South East. We also see

**“ TechnipFMC will continue to use its subsea studio digital solution to optimise the development, execution and operation of Jubilee South East.”**

our work on this project as an opportunity to further develop our local content in Ghana, with the fabrication of a number of subsea structures, including production and water injection manifolds, carried out in-country.”

Echoing Landes, Rahul Dhir, CEO, Tullow Oil plc, commented, "Working closely with the government of Ghana and our joint venture partners in Ghana, I am confident that we will unlock the full potential from the Jubilee and TEN fields through this multi-year, multi-well drilling programme.”

Another company, Ecoslops, has signed a fourth Letter of Intent with Marine Bunkers Ltd for a Mini Petroleum Residue Recycling (P2R) unit that aims to

establish a unit in the port of Tema in Ghana.

The P2R unit will recycle 98% of oil waste in Tema and the Gulf of Guinea region. "The reuse of these oil residues will notably reduce illegal dumping (maritime or land-based), thus contributing to the preservation of the resource. It will also cut greenhouse gas emissions per ton of fuel produced by a factor of three, unlike a conventional oil production cycle," stated Ecoslops.

The project aims to enable Ghana to expand its maritime facilities, while also improving the value-added services and job creation. In addition, Ecoslops further added that it will train Ghanaian oil and gas operators to comply with international regulations. ♦



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# INTELLIGENT LIFTING FOR OIL AND GAS

The increasing spread of digital control and monitoring in Africa's oil and gas sector has fuelled the emergence of cutting-edge artificial lift systems giving operators full exposure for introducing more intelligent products.

**I**N THE WORLD of automation, artificial lift is widely used across end-users to increase production and get maximum margins from assets. All the oil and gas wells across the world require artificial lift to maintain and boost production at high efficiency.

According to Verified Market Research, the global artificial lift market size was valued at US\$7.96bn in 2020 and is projected to reach US\$11.67bn by 2028, growing at a CAGR of 4.90% from 2021 to 2028. Rapid industrialisation along with rising demand for energy across the world is expected to drive the artificial lift market over the predicted years.

Technologies to support artificial lift continue to evolve and find their way into the upstream sector.

In line with the attractive growth forecast of the global artificial lift market, Wanner International Limited has launched its Hydra-Cell Jet Pump Hydraulic Artificial Lift Solution that aims to reduce the cost of lifting a barrel of fluid, reducing costs in oil and gas production, generating huge savings over the lifetime of a well.

"The seal-free, no packing API674 system is suitable for mainstream oil and gas production. It does not require a workover rig, pulling unit or slick line unit for servicing or well



*Wanner International has unveiled the Hydra-Cell Jet Pump Hydraulic Artificial Lift Solution.*

Image Credit: Wanner International

production optimisation," stated the company.

According to the company, the lifetime costs of this artificial lift solution are lower than any other hydraulic artificial lift methods. When combined with the 90% efficient Hydra-Cell seal-less surface pumps, jet pumps have the best overall total process efficiency, in barrel per day produced per horsepower consumed.

Additionally, in terms of maintenance and servicing saving, no workover rig is needed. The seal-less, packing-less design of the API674 Hydra-Cell pump results means no separate lubricators, or site services for lubricators, no seal flushing

and no fine filtration needed.

Paul Davis, managing director of Wanner International, said, "The Wanner Hydra-Cell Jet Pump Hydraulic Artificial Lift Solution can be installed at a significantly lower cost over the lifetime of the well. There are no downhole movable parts and the surface high pressure power fluid injection units can be operated by natural gas, diesel or electric powered drivers."

## Enhancing effectiveness of artificial lift systems

ChampionX, a global provider of highly-engineered equipment and technologies for oil and gas, released the latest version of its

XSPOC production optimisation software earlier this year to deliver greater efficiencies in wells on artificial lift. Already used by several supermajors, the software employs artificial intelligence to remotely analyse well data and provide greater insight into the effectiveness of artificial lift systems.

This aims to deliver greater production, reserves recovery and efficiency while reducing energy consumption. During a recent project, one operator was able to reduce the number of cycles on more than 100 rod lift wells by 50%, avoiding associated failures and deferred production. 🔥

# CONTAIN GAS FLARING

Ravindra Jayant Puranik, associate project manager (APM) at GlobalData, speaks with Deblina Roy about the gas flaring issues and the importance of developing strategies to eliminate flaring.

## Why is gas flaring a pressing issue in upstream sector?

Associated gas is primarily generated during the production of crude oil in upstream oil and gas industry, making this sector the dominant source of gas flaring. The volumes of gas obtained during crude oil production are extremely low, which deters operators from constructing new gathering and transportation pipelines. Moreover, lack of existing

infrastructure and low natural gas prices make utilisation of the associated gas uneconomical.

As a result, the associated gas is generally flared off. Sustained rise in global crude production has led to an increase in global gas flaring in the last decade. Gas flaring results in release of greenhouse gases into the atmosphere in the form of CO<sub>2</sub>, CO and traces of NO<sub>x</sub>, SO<sub>x</sub> and others. These gases contribute towards the

global phenomenon of global warming and climate change.

## What strategies can be taken to reduce and subsequently eliminate gas flaring from oil and gas operations?

Increasing public awareness about gas flaring is the first step to tackle the issue. The awareness can then translate into demographic pressures on the establishment and industry participants to develop strategies

## Vertical Pressure Leaf Filter

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### Application

- Resins
- Bleaching earth / activated carbon
- Crude oil
- Ni-catalyst
- Brine Filtration
- Glucose
- Fatty acid
- Winterisation
- Electrolyte
- Beverage Industry

## Horizontal Pressure Leaf Filter

Sharplex Horizontal Pressure Leaf Filter (shell retraction or bundle retraction) features horizontal pressure vessel, filter leaves, pneumatic vibrator assembly, bottom structure housing, hydraulic power pack for bonnet ring opening / closing and shell or bundle retraction. Filter leaves are mounted on a central outlet manifold with perfect 'O' ring sealing. Filtration areas from 2m<sup>2</sup> to 200m<sup>2</sup>. Dry cake discharge or wet cake discharge is possible.

Filters are also supplied with fix or oscillating sluicing arrangement for wet cake dislodging.

### Application

- Bleaching earth filtration
- Wax filtration in edible oil industry
- Hydrogenation (catalyst filtration)
- Crude oil filtration in edible oil
- Alkyd resin filtration
- Molten sulphur filtration
- Catalyst filtration



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to eliminate flaring. The World Bank's Global Gas Flaring Reduction (GGFR) partnership is one such initiative helping to create awareness about the gas flaring issue while also providing financial, technical, and regulatory guidance to tackle the same.

A possible solution to flaring is to build infrastructure to collect and use the stranded gases. This could require financial support from government and investors, especially if the pipelines are to be constructed on a large scale. Saudi Arabia's Master Gas System (MGS), established to collect stranded gases at crude oil production sites, is a classic success story in this regard.

Other approaches that may be adopted to utilise associated gases include, using gas for captive power generation, enhanced oil recovery (EOR), small-scale LNG, small-scale GTL and CNG.

### **In Africa, which countries are showing positive development in minimising gas flaring issues?**

The year 2020 was an unprecedented year for the oil and gas industry, where production was affected by the demand shock from the COVID-19 pandemic. As countries entered into lockdowns, oil prices started crashing. Producers, even the ones in Africa, responded by cutting crude output, which in turn led to an overall decrease in flaring from the region. All 10 leading crude oil producing

**“ Nigeria and Chad showed a decline in gas flaring volume and intensity. Algeria, Egypt, Gabon and Equatorial Guinea showed an increase in gas flaring intensity. Ghana displayed a stark jump in gas flaring volume and intensity in 2020, as compared to 2019.”**

*The year 2020 was an unprecedented year for the oil and gas industry.*



Image Credit: Adobe Stock

countries in Africa showed a decline in production. Hence, it is difficult to ascertain the impact of measures taken by any country to contain flaring.

Nigeria is the largest crude oil producer in Africa, followed by Angola and Algeria. These countries fare poorly in terms of the volume of gases flared in the world. The countries are heavily dependent on their native oil and gas production for GDP. It has also led these countries to lose opportunities in monetising the associated gases. In Angola, the volume of gases flared represented two-thirds of its natural gas production in 2020. The country has observed a steady downward trend in gas

flaring volume and intensity since 2016. However, this coincides with the declining crude oil production and increasing investments in LNG projects.

In the year 2020, the leading crude oil producers in Africa displayed varying reactions to volatile crude oil prices, in terms of gas flaring volumes and intensity. While gas flaring volume indicates the amount of gases flared off, gas flaring intensity indicates the amount of

natural gas flared per usable barrel of crude oil produced. Nigeria and Chad showed a decline in gas flaring volume and intensity. Algeria, Egypt, Gabon and Equatorial Guinea showed an increase in gas flaring intensity. Ghana displayed a stark jump in gas flaring volume and intensity in 2020, as compared to 2019. Libya had a strong y-o-y decline in gas flaring volume in 2020 but recently displayed a slight increase in its flaring intensity. 🔥

## **Global cooperation is essential**

GAS FLARING INVOLVES excess natural gas being burnt or flared off during an oil and gas operation. Gas flaring takes place across the oil and gas value chain but is predominant in the upstream sector. Gas flaring has often been an easier recourse than harnessing the excess gas. Hence, it is natural that the largest exploration and production companies will contribute the most towards flaring.

The growing public awareness about global warming and climate change have catapulted world leaders to address the gas flaring issue. Global platforms such as the UN are encouraging countries to set themselves targets to reduce and subsequently eliminate gas flaring from oil and gas operations. Industry consortiums such as IPIECA and OGCI are designing framework to decrease gas flaring. Active participation of industry leaders along with the support from regulatory bodies in gas flaring countries would expedite the reduction of global gas flaring, stated GlobalData.

# NIGERIA LEADS NEW-BUILD VDU CAPACITY ADDITIONS

Africa is expected to register the highest refinery vacuum distillation units (VDU) capacity additions globally during 2021 to 2025, according to GlobalData.

**A**CCORDING TO GLOBALDATA'S Global Refinery Vacuum Distillation Units (VDU) Outlook to 2025 – Capacity and Capital Expenditure Outlook with Details of All Operating and Planned Vacuum Distillation Units, Africa is likely to witness total VDU capacity additions of 936 mbd by 2025. Of this, 917 mbd of capacity would be from new build refineries and the remaining capacity from the

expansion of existing refineries.

Teja Pappoppula, oil and gas analyst at GlobalData, commented, "Nigeria leads new build VDU capacity additions in Africa by 2025, accounting for around one-half of the total capacity additions. The planned Lagos I refinery accounts for the majority of the capacity additions in the country, with a capacity of 312 mbd expected to be added in 2022. The Mostorod II refinery in Egypt is the only

upcoming expansion project in Africa with 19 mbd of capacity expected to be added in 2022."

GlobalData identifies Asia as the second highest contributor to the global VDU capacity additions, accounting for roughly 29% of the total additions by 2025.

The Middle East ranks third globally, contributing an estimated 20% of global VDU capacity additions during the outlook period. ♦



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# MOZAMBIQUE: THE NEXT INVESTMENT DESTINATION?

Mozambique has been identified as one of the most promising energy sectors globally, with lucrative natural gas reserves positioning the east African country as a globally competitive investment destination.

**M** OZAMBIQUE HAS RAPIDLY emerged as a competitive investment destination, with its significant energy reserves, prime geographical and demand placement and market-driven approach to energy sector development. With more than 100 tcf of natural gas reserves, the largest untapped coal reserves worldwide, and one of the largest hydroelectric facilities in Africa, the country has positioned itself as both a hydrocarbon and renewable energy leader.

Despite development delays caused by the Covid-19 pandemic and political insurgency in the northern province of the country, the Ministry of Mineral Resources and Energy is committed to accelerating energy sector growth through ensured operational security, public-private sector collaboration and regional support.

The state-owned Empresa Nacional de Hidrocarbonetos (ENH) has been an instrumental organisation in the country's energy transformation. Representing the state in petroleum operations, and with a core mission to add value to natural resources through commercial participation, ENH has positioned itself as both a leading African state company, and key driver in Mozambique's energy growth.



Image Credit: African Energy Chamber

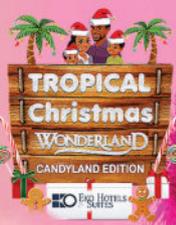
HE Ernesto Max Elias Tonela, Mozambique minister of mineral resources and energy (MIREME), will lead the Mozambican industry delegation to Cape Town.

Additionally, global energy majors such as TotalEnergies, ExxonMobil, Anadarko Petroleum, Sasol, Chevron, BP, Petronas and China's CNPC are working collaboratively with government to drive Mozambique's energy sector growth, and the country is well on its way to lead Africa in the move towards natural gas.

Some of the notable projects include TotalEnergies' offshore area 1 development in the Rovuma Basin – whereby Total managed to secure the largest private debt-raise in African history, securing approximately

US\$15bn in financing; ExxonMobil's Rovuma LNG Liquefaction plant in offshore area 4 of the Rovuma Basin; and the US\$8.6bn Coral South Floating LNG project. With capacity pegged at 13mn tons, 15-16mn tons and 3.4mn tons of LNG per year, respectively, these projects have positioned the country as a globally competitive natural gas giant. Also, Mozambique is home to Africa's largest ever foreign direct investment project, Mozambique LNG, which is poised to deliver a wide range economic benefits to its communities.

Highlighting these significant developments, HE Ernesto Max Elias Tonela, Mozambique minister of mineral resources and energy (MIREME), will lead the Mozambican industry delegation to Cape Town at African Energy Week (AEW) 2021 from 9-12 November. The minister and the ENH will showcase the country's current and upcoming projects, promote its role as a regional natural gas producer and distributor and emphasise effective strategies for project activities in the east African nation. ♦



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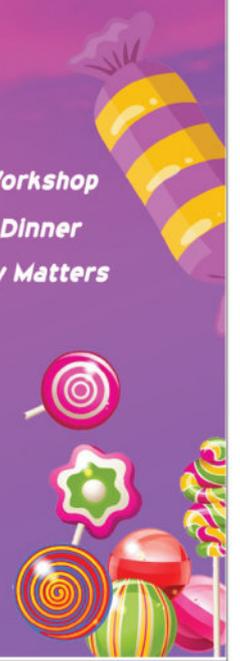
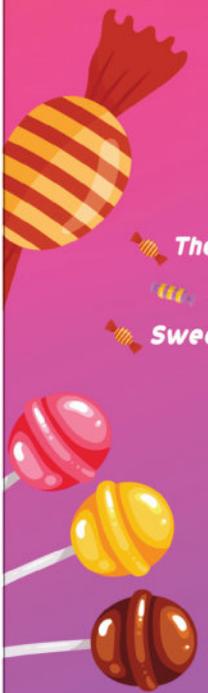
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# THE CRITICAL ROLE OF FIRE DETECTORS IN FIRE SUPPRESSION

Flame detectors are key to an effective fire suppression system, says Nishant Thankappan, business development manager - Analytical & Detection, Emerson Automation Solutions.

**M**ANY PLANTS AND facilities deal with large quantities of flammable and explosive liquids and gases that, even with the application of best practices, are prone to equipment and operator errors, causing leaks and resulting in fires.

The first step to battling a blaze is recognising when it is happening through selecting and applying the right detectors for spotting flames, with little to no false alarm conditions.

Fire detection and prevention can be carried out immediately before incidents escalate with effective safety systems and personnel training.

## Detecting flames

Humans recognise flames through the light and heat they generate. However, different fuels burn differently, as alcohol burns almost invisibly compared to oil. Flame detectors can distinguish these differences (Figure 1) and identify hot emissions and products of combustions, radicals, and other by-products in the electromagnetic spectrum. When placed effectively, these can trigger a response in a matter of seconds.

Regardless of the fuel source, flames and the resulting hot gases generate electromagnetic radiation in a variety of wavelengths (see Figure 1) from ultraviolet (UV) through the visible spectrum and into

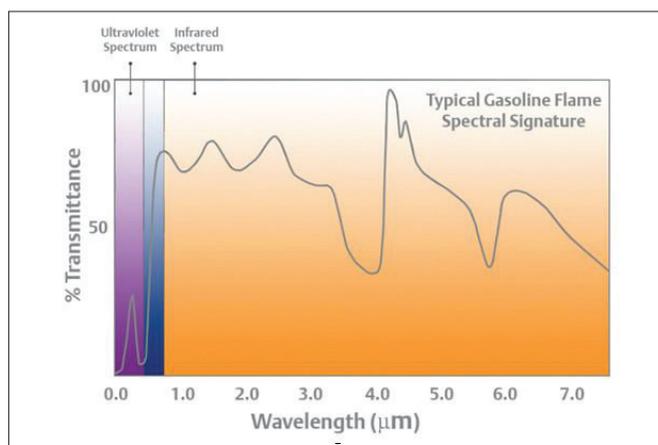


Figure 1. Combustion creates electromagnetic emissions across a wide range of wavelengths. This spectrum is typical of hydrocarbon combustion.

infrared (IR). Hydrocarbon fire creates hot carbon dioxide emissions at 135-260nm, detected by UV, and 4.2-4.5 µm (micrometers), detected by IR. Hot carbon dioxide has a strong peak at 4.2 – 4.5 µm, with hot water vapour at 2.7 µm. Flame detectors are typically designed to detect light emission at those wavelengths with intensity patterns common to open flames.

## Understanding flame detector technologies

UV detectors respond to radiation in the 0.18 – 0.26 µm range. They offer the fastest response and good sensitivity at comparatively short ranges (0 – 15 m for a 0.1 square meter heptane pool fire). The downside is their susceptibility to arc welding, halogen lamps, and electrical discharges such as lightning.

UV/IR hydrogen detectors combine a UV optical sensor (0.18 – 0.26 µm range) with an IR sensor (2.7 – 3.0 µm range) designed to detect water vapour from hydrogen and hydrocarbon combustion. The combined UV/IR flame detector mitigates the drawbacks of a straight UV detector so it can be used outdoors, but with a slightly slower response time.

SYS-PRO-ADMIN MSIR multi-spectrum infrared detectors zero-in on infrared spectral regions at 2.7 – 3.0 µm and 4.2 – 4.7 µm to detect water and carbon dioxide emissions. The hot water band is particularly useful for detecting hydrogen fires, the flames of which are practically imperceptible in the visible light range. This type has a long range and high immunity to smoke and false alarms.

MSIR multi-spectrum hydrocarbon detectors concentrate on a wide infrared band to detect carbon dioxide emissions produced by hydrocarbon fires but with no sensitivity to water vapour. This type can detect fuel and gas fires at long range and has high immunity to false alarms, but cannot recognise hydrogen fires.

Visual flame detectors employ a charged couple device (CCD) image sensor and flame detection algorithms. The imaging algorithms process live video images from the CCD array and analyse the shape and progression to discriminate between flame and non-flame sources. Unlike IR or UV flame detectors, CCTV visual flame detectors do not depend on emissions from carbon dioxide, water, and other combustion products to detect fires.

Emerson's Rosemount 975 Flame Detector family offers a wide range of sophisticated flame detectors. Rosemount 975MR MultiSpectrum Infrared detects hydrocarbon fuel and gas fires at long distances and provides the highest immunity to false alarms. Rosemount 975HR Multi-Spectrum Infrared for Hydrogen offers the combined capability to detect hydrocarbon and hydrogen fires. Rosemount 975UR Ultraviolet Infrared Dual UV and IR detector is suitable for detecting flames produced by clean-burning hydrocarbon fuels. ♦

# OFFSHORE ‘FLEXDELIVERY’ IN NIGERIA

P&O Maritime Logistics and Nigerian firm IO Materials Services (IOMS) have launched ‘FlexDELIVERY’ model to provide integrated last-mile delivery services to the offshore energy industry in Nigeria.

**F**LEXDELIVERY IS ALL set to disrupt the traditional model of high shore base startup costs, rentals and vessel time-chartered contracts by focusing on the service that is required by the energy industry – cargo delivery. FlexDELIVERY has marked new grounds with a freight rate model targeted at the offshore energy industry which traditionally worked on an asset and facility model.

This service proves to reduce delivery times, enhance visibility and predictability which will

re-invent procurement strategies, inventory management tactics and the energy supply chain as a whole.

By injecting a tech-led solution, FlexDELIVERY enhances visibility throughout the last mile delivery which has been a bottleneck for some time. Harnessing Big Data and AI technology, it provides predictability with a real time view on cargo movement and delivery dates, all controlled through an online booking platform. The platform

reinforces the integrity of the energy supply chain, providing energy producers with peace of mind to focus on their core business being extraction of energy.

The new offering is an expansion of P&O Maritime Logistics’ disruptive innovation ‘Supply on Demand’ to integrate shore base and quayside operations to deliver a comprehensive logistics solution, strategically named FlexDELIVERY for the Nigerian market. ♦

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# SOUTH AFRICA'S ROAD TO NET ZERO EMISSIONS WILL BE VIA GAS

International Energy Agency has acknowledged that there will be different paths to clean energy. Gas is therefore an obvious bridge to a lower carbon future in South Africa, explained Dr Phindile Masangane, CEO of the Petroleum Agency SA.

**T**ODAY THE BIGGEST threat to humanity is climate change, and the biggest threat to South Africa's social stability is the high unemployment rate, which has primarily been caused by economic stagnation.

As the global economy recovers from the devastating effects of Covid-19, demand for oil and gas has gone up significantly. If there was ever a need for proof that oil and gas still drive the global economy, recent statistics demonstrate the trend.

The urgency for action to mitigate the risk of climate change is no longer debatable. Between 1990 and 2018, the top five emitters have produced more than 50% of greenhouse gas emissions. During the same period, South Africa has contributed 1% to global emissions. This is by no measure insignificant, and as a responsible global citizen South Africa must take steps to reduce its carbon footprint.

The UN Framework Convention on Climate Change was established in 1992 to co-ordinate the global response to mitigate the threat of climate change, and specifically to get countries to commit to policies and plans that will ensure that the average global temperature rise is kept less than 1.5°C above pre-industrial levels.

The International Energy Agency (IEA) proposes that to achieve this goal the world's energy sector must reach net zero emissions by 2050. In its global energy net zero 2050 pathway the IEA acknowledges that there is no single pathway to this goal, as developed and developing countries face different socioeconomic challenges and have contributed disproportionately to greenhouse gas emissions to date.

What a number of environmental interest groups seem to be ignoring in the IEA "Net Zero by 2050" report is the acknowledgment that there will be a differentiated approach to a



*Dr Phindile Masangane is the CEO of the Petroleum Agency SA.*

clean energy future, taking into consideration the cost of the new clean energy technologies and the economic consequences of transitioning for each country. The IEA emphasises that each country must develop its own pathway to a net zero emission future.

South Africa's economy has been predominantly powered by coal, which is also a significant contributor to the country's economy in terms of GDP as well as employment. Of all primary energy resources coal is the most carbon intensive, and South Africa, therefore, has a relatively high carbon intensive economy, contributing about 1% of annual global greenhouse gas emissions. The use of coal produces fine particulate matter that affects people's respiratory systems.

In addition to coal, South Africa imports oil, gas and petroleum products for its energy needs as the upstream petroleum industry is

still at a nascent stage. The two recent world class gas discoveries in the Outeniqua basin off the south coast of the country are the biggest petroleum discoveries made in South Africa.

The development of these discoveries has the potential to replace more than 2,300MW of diesel fired electricity generation in Gourikwa, Dedisa and Ankerlig, thereby reducing the carbon emissions from these plants by more than 50% while eliminating sulphur oxide and nitrogen oxide emissions, which are also harmful to the environment. Gas is therefore an obvious bridge to a lower carbon future in South Africa.

Importantly, these gas discoveries could restore the gas-to-liquid refinery in Mossel Bay to full production and profitability, saving about 1,200 direct jobs. A complete shutdown and abandonment of this refinery would not only lead to job losses at the refinery, but the effects would reverberate throughout the town of Mossel Bay and the southern Cape region, since the refinery contributes about R2bn a year, or 26% of the Mossel Bay economy, and 6% to the Southern Cape economy when producing at full capacity.

The Petroleum Agency SA awaits the licensee of these gas discoveries submitting its production right and environmental authorisation applications when the exploration right expires, or earlier. The agency expects the licensee to use world class technologies and standards to minimise the effects of the gas and gas condensate production on the environment, while maximising the in-country benefit or local content from this development to support South Africa's economic recovery.

These discoveries could indeed support both the country's economic recovery and its transition to a clean energy future. ♦

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# INTERCHANGEABILITY AND SUSTAINABILITY FOR SAND MANAGEMENT

Krzysztof Buchajczuk, senior application engineer, Tendeka. Explains “inflow plug and play” approach which is immensely helping reservoir performance.



Image Credit: Tendeka

The seven-metre jackets (left to right) are fitted with layers of the premium mesh screen jacket with an outer shroud on the outside and a drainage layer underneath.

**T**HE ABILITY TO utilise interchangeable inventory has a major impact on the amount of equipment needed to address multiple projects simultaneously as well as the need for contingency planning. Thereby, minimising the amount of material used and optimising logistics are the key.

To contribute to a sustainable future for the oil and gas sector, where efficient use of resources is vital, Tendeka has adopted an “inflow plug and play” approach to sand and inflow control with interchangeable equipment supply and fitting.

The process involves the standardisation of equipment while still maintaining flexibility in the design. This means that the same chassis can be used for multiple applications and customised immediately prior to installation to optimise reservoir performance. A smart control framework to manage sand production and inflow control will consider the most efficient combination of screen filter size, type, and mechanical rating selection. The benefits of this approach include:

- ◆ Improved reservoir performance: flexible “plug and play” approach allows for final sand and inflow control design to be optimised at the rig site based on the latest reservoir and formation evaluation data.

- ◆ Minimised tooling and machinery adjustments leading to improved manufacturing efficiency.
- ◆ Minimised waste through repeatability and reliability.
- ◆ Efficient supply chain and material management by using metallurgy suitable for producers and injectors.
- ◆ Streamlined screen manufacturing process.
- ◆ Flexibility due to re-use of raw materials when plans change.

Key to the process is supplying the equipment ready to house multiple solutions. Each joint of sand screen with inflow is supplied with two standard tapped apertures that can be configured to have any combination of valves including autonomous inflow control devices (AICDs), passive ICDs, injection valves, blanking plugs (or even fully open ports in some cases), that can

**“Tendeka’s approach is to standardise the lengths and material grades of the screen jackets utilising inflow control devices.”**

be changed on site, if need be, depending on well conditions.

Tendeka’s approach is to standardise the lengths and material grades of the screen jackets utilising inflow control devices which constitute by far, the majority of the screens produced by the company. This significantly reduces manufacturing costs and waste created during construction.

As an example, by eliminating the necessity to change length and OD of every ten screens, the advanced completions and production optimisation specialist can build about 35% more screens per day than if a customised design was needed. Most notably, the percentage of custom-built screen designs beyond the proposed scope decline each year due to this plug and play philosophy.

This agile approach can enhance decision-making to select or swap, at the most appropriate interval, inflow, outflow or check valve devices to counter saturation, possible sand production, porosity, and permeability, at any time. It is a game changing ability for an industry now more focused than ever on efficient, sustainable, optimum performance. ◆

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# IS NATURAL GAS A TRANSITION ENERGY OR NOT?

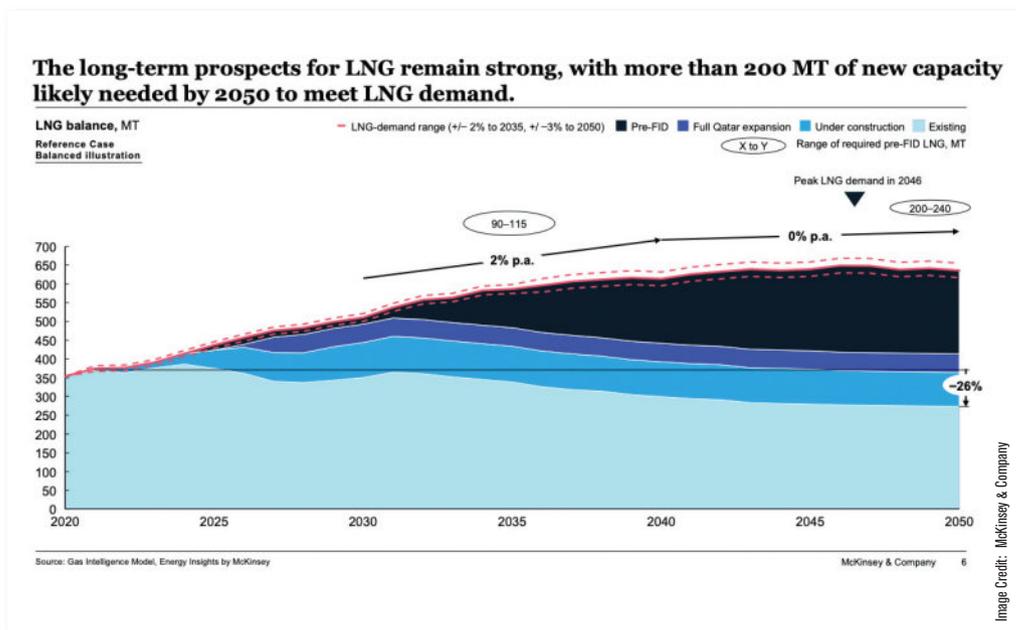
Amphora, a global provider in today's LNG marketplace and provider of CTRM and shipping services, explores the question concerning natural gas and how it figures in the step towards achieving a lower carbon economy.

**I**N THE PAST decade, there was a tacit acceptance that two energy sources would be required to help the world economy transition from carbon-based fuels to a renewable pathway – nuclear and natural gas. For many, the report published by the IEA in May was a bombshell. The world will fall short of bringing energy related carbon dioxide emissions to net zero by 2050. The bombshell part related to our natural gas production.

“Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway, and no new coal mines or mine extensions are required,” the report goes further.

“The unwavering policy focus on climate change in the net zero pathway results in a sharp decline in fossil fuel demand, meaning that the focus for oil and gas producers switches entirely to output — and emissions reductions — from the operation of existing assets.”

The IEA focuses on the target for the world to reach the goal and limit the global warming temperature rise to 1.5 degrees Celsius, setting out 400 milestones in its roadmap to net-zero by 2050. The landmark publication has many detractors who have somewhat missed the point of the roadmap – its purpose was to highlight the



McKinsey global outlook of LNG demand.

sheer scale of the challenge and a practically endless list of changes that need to be made.

### So where does that leave natural gas?

Bottom line, the report has taken a consensus on gas consumption rising and said we need to slash these figures. On current projections, there is steady rise by

2030 of just under four trillion cu/m. In February 2021, McKinsey predicted a 6% increase in gas demand by 2050.

Yet the IEA report in May, aiming for a tougher 1.5 degrees Celsius temperature limit, places demand by then should actually be just 1.75 trillion cu/m – a ~60% drop from 2030.

A well-publicised event last

year occurred when Engie of France was told by its national government to hold off signing a multi-billion dollar term deal with the USA producers. The government cited environmental implications, namely the release of methane during the production phase through shale deposits. Dismissed as political posturing at the time, the deal was indeed never signed – the provenance of natural gas is now a very real topic. ♦

**“ Arguments against the role of natural gas as a bridge fuel are not new. In fact, scientific papers have been in abundance for a decade or more.”**

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# HTS SATELLITES IN OIL AND GAS

Joel Schroeder, director, land mobile, Intelsat, responds to the growing need to search for more remote and satellite-based operations in difficult-to-reach areas – both on land and at sea.  
Deblina Roy reports.

## What has HTS enabled that was not available before it arrived?

HTS satellites have been designed to meet the booming demand in connectivity, since they can provide far more throughput than existing wideband satellites, with increases in throughput of up to 400%. The use of focused spot beams enables enhanced performance, coverage footprints and connectivity efficiency. Research organisation NSR predicts that demand for HTS capacity for land mobility should reach 24 Gbps by 2028, up from less than one Gbps in 2017.

## Why is demand for HTS capacity from mining and oil and gas companies still strong, given the continuing spread of terrestrial connectivity?

Oil and gas companies, as well as mining companies, operate in harsh environments and hard-to-reach areas. Whether it is to inspect facilities, monitor leaks, service equipment or monitor workers travelling between locations, they require always-on network availability. With its ubiquitous service footprint and high network uptime, satellite communication is the best way to deliver broadband connectivity to the oil and gas industry on a global basis. Around 70% of respondents to a recent survey conducted by Intelsat amongst oil and gas executives say 'support



*HTS can help improve operational efficiency and performance, enabling technologies such as IoT and AI, and allowing the workforce to make value-based real-time decisions.*

for remote operations' is one of the top three benefits of satellite connectivity in supporting mobile vehicles and/or temporary site operations.

More specifically, HTS can help improve operational efficiency and performance, enabling technologies such as IoT and AI, and allowing the workforce to make value-based real-time decisions. Despite the spread of terrestrial connectivity, many of the areas where the industry operates are unconnected and satellite

technology provides a powerful, cost effective and easy to install solution to the oil and gas industry's connectivity challenges.

## Is some of this being driven by the need to search for oil and gas in more remote and difficult-to-reach areas – both on land and at sea?

With the IEA expecting global oil demand to rise every year through 2026, oil and gas companies are exploring new areas, on land and at sea. They

need to find new operational efficiencies to help them operate optimally in these far away, often harsh areas. For this, operators need technologically advanced solutions that enable always-on and robust connectivity even in the most remote regions.

## Which bands are we talking about – Ka? Ku? C-band? Are there still issues around attenuation (the effect of heavy rain on Ka, for example)?

There have long been discussions on the topic of Ku- and Ka-bands.

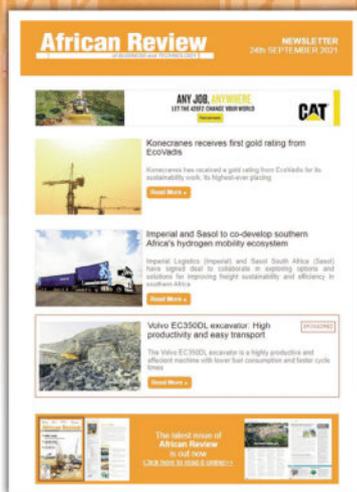
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When it comes to rain, Ka-band is much more impacted by heavy rainfall that can lead to a weaker signal or even its complete loss – not ideal for the oil and gas industry that requires robust connectivity at all times, regardless of the location.

Global constellations of Ku-band satellites such as operated by Intelsat combine wide-beam and spot-beam, ensuring a depth of coverage that provides end users with resiliency and redundancy unavailable in Ka-band. Switching between these Ku-band options to direct capacity to where it is needed most is possible because of the open architecture compatibility between Ku-band HTS and wide-beam satellites.

Therefore, when selecting a satellite solution, the oil and gas industry should assess link budget, network uptime/availability and the needs of some applications or end users that might require a very high uptime which could be impacted by rain fade.

**How much bandwidth is available on satellite services? Thanks to Ka, more satellite launches and more efficient usage, I assume there's a lot more to play with than there would have been ten years ago. Is that true?**

With its multiple layers of redundancy making it available at any time, Ku-band remains an ideal solution for oil and gas users who operate in off-the-grid locations. But, with the industry looking for optimal connectivity solutions, the past few years have seen many ground-breaking innovations.

For example, High Throughput Satellites (HTS) have pushed the boundaries further by providing far more throughput than traditional satellites, while two Mission Extension Vehicles (MEV-1 and MEV-2) have given five years of extra life to two satellites. LEO

constellations are being launched and will be operational in a few years. Also, new managed services such as Intelsat FlexMove enable connectivity on-the-go, meeting the requirements from on-site oil and gas exploration to the trucks and vehicles travelling hundreds of miles through unconnected areas.

We are already working on defining the connectivity of tomorrow, with a new class of incredibly powerful software-defined satellites that will launch over the next few years. They will allow capacity to be instantaneously reconfigured and repositioned in response to ever-changing customer demand, significantly improving the economic equation for customers, and making networks even more flexible, accessible, relevant, and cost-effective for them.

**What applications might an oil company use HTS for in remote contexts?**

Oil companies are increasingly relying on bandwidth-hungry complex applications to operate and have started introducing technologies such as IoT and AI to help them improve operational efficiency and performance. For example, such applications will help address leak and flow issues that can affect well integrity, the dynamic nature of leak and flow events requiring constant monitoring to capture their intermittency.

**And how would an oil company use a hybrid connectivity approach to cover both its remote and local needs?**

Recent advancements in satellite connectivity are making it possible to use high-throughput satellite connectivity in a cost-effective way in combination with terrestrial wireless services, creating a “network of networks” hybrid solution that can provide organisations with remote

operations and on-the-move site workers with easy-to-deploy communication options that can help quickly scale operations where and when they're needed most. Where cellular/fibre networks aren't available or are cost-prohibitive, oil and gas companies can switch to satellite connectivity anywhere needed to ensure operations and data continues to run seamlessly.

**Is there a redundancy aspect to your hybrid network suggestion? That is, would it be helpful for an oil and gas operation to keep satellite as a backup in mission-critical contexts – even if it wasn't used?**

Intelsat blankets the earth with multiple layers of wide-beam and spot-beam capacity, ensuring the network not only provides high-density coverage where it is needed most, but also a high-degree of redundancy should bandwidth become constrained or an asset encounter anomalies. The Intelsat global network has one of the highest network uptime, operating consistently at 99.9% availability which makes it attractive for remote operations like oil and gas.

**Satellite is still a more expensive option than cellular. Do you see competition and/or standardisation bringing hardware and connectivity prices down?**

Our managed service FlexMove has been designed to make it easy for oil & gas operations to benefit from speeds up to 10Mbps for a fraction of the cost when compared to narrowband satellite services. The next generation, software-defined satellites, in which Intelsat is actively investing in, will further improve the economic equation for customers. With the solutions we've put in place and the innovations we are working on; oil companies are future proofing their investment.

**Is the “network of networks” hybrid solution you refer to completely seamless or is there still work to be done for a data call on the move (say) to intelligently seek satellite signals when a terrestrial signal is unavailable or too weak?**

The Intelsat FlexMove network is paired with a portfolio of pre-configured, fully integrated terminals which enable an array of comms-on-the-move and comms-on-the-pause applications including autonomous and remote vehicle operation as well as real-time video streaming for advanced site security. This is made possible because of the easy-to-deploy design of these very compact, highly portable and mobile terminals. For instance, our portable connectivity solutions have auto acquisition of satellite signal capabilities that enable any user to connect to the internet, complete VoIP calls and run data-intensive applications in under five minutes.

**Intelsat FlexMove is part of the move towards hybrid connectivity you describe. How do you see it evolving?**

Intelsat FlexMove is the first HTS solution for Land Mobility users and enables robust, reliable internet access via public internet or private IP connection to support access to a private network for users in remote, hostile, emergency, or temporary locations. FlexMove creates the ultimate connectivity safety net by enabling bandwidth-hungry applications at speeds up to 20x faster than narrowband satellite solutions, relying on Intelsat's global network. With “difficulty of network setup and management” cited as a top drawback of satellite adoption for Land Mobility organisations surveyed by Intelsat, we believe that FlexMove will play an increasingly important role as it helps overcome this barrier. ♦

# AFRICAN RIG COUNT

COUNTRY	August 2020	September 2020	August 2021	September 2021
CÔTE D'IVOIRE	0	0	2	2
EQUATORIAL GUINEA	0	0	0	0
GHANA	0	0	1	1
KENYA	3	3	5	5
LIBYA	13	9	13	14
MAURITANIA	0	0	0	0
MOROCCO	0	0	0	0
MOZAMBIQUE	0	0	1	1
NIGERIA	8	10	11	11

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# A DYNAMIC MARKET FOR THE CHANGING ENERGY WORLD

Hosted by the Abu Dhabi National Oil Company (ADNOC), the Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC) is an influential meeting place where oil, gas and energy professionals will convene in-person from 15-18 November, to identify the opportunities lying ahead.

**R**ECENT CHANGES IN the oil and gas industry have altered the balance of power in energy markets, creating new pressures for producer countries, new strategic considerations for international energy companies and new opportunities for companies providing the technology and services to navigate these changes.

Under the theme of 'New market dynamics in a changing energy world', on 15 November, the first day of the ADIPEC 2021 Strategic Conference opens with a series of must-attend sessions for attendees looking to understand the global trends, demand patterns and medium- and long-term outlook for the industry.

ADIPEC 2021 will be the first major energy exhibition and conference taking place after COP26, where CEOs, government ministers from around the world and energy experts will address the content raised at COP26 and set out the future of the sector.

Through a series of panels, interviews, debates, keynote addresses, live studio commentary and live sessions, the Strategic Conference will continue on 16-18 November, each day under a major theme. On Tuesday 16 November, industry leaders and experts will shed light on the new energy



*The last in-person event in 2019 provided opportunities for buyers and sellers to meet, learn, network, do business and discover new products, solutions and technologies.*

agenda and the opportunities it presents. Wednesday 17 November takes a look at how to build the energy company of the future and what these new business models and investment flows will look like. Thursday 18 November examines how innovations and transformational technology are supporting the energy transition.

## Hydrogen: The fuel of the future?

As a highly flexible energy carrier, hydrogen can potentially deliver a holistic, clean, integrated and multi-sector systems approach to energy that could contribute decisively to solving energy's

environmental issues and securing net-zero targets.

Through dedicated hydrogen sessions at the ADIPEC Strategic Conference, the global oil, gas and energy industry will gain key insights from the industry leaders at the forefront of the hydrogen industry. Discussions will include new business models and strategies required to unlock, create and maximise value from hydrogen's potential as a future clean energy source.

## 2021 technical conferences

The ADIPEC Technical Conference is the single largest technical meeting place for oil

and gas engineers worldwide, providing unprecedented access to the latest industry knowledge, technical expertise, applications, products, solutions and services.

Organised by the Society of Petroleum Engineers, the ADIPEC Technical Conference sessions are all set to sharpen knowledge, share best practices and network with the industry peers from anywhere in the world.

The ADIPEC Technical Conference provides the opportunity to learn, meet and network with more than 8,000 fellow engineers from around the world, working in different oil and gas producing environments and facing different challenges. ♦

# Sonardyne releases new vehicle navigation platform model

SONARDYNE, AN ENERGY, defence and science marine technology company has introduced a new model of its hybrid, underwater and surface vehicle navigation platform, SPRINT-Nav Mini.

The new Navigator version extends the capability of the Guidance model, by calculating and providing the position of a remote, autonomous or piloted underwater vehicle, or uncrewed surface vessel, in addition to its velocity, depth and attitude.

SPRINT-Nav Mini is engineered to provide accurate, precise and robust guidance, and also survey and inspection capabilities, for vehicle platforms that would normally not be able to



Expanding the horizons for underwater robotics – Sonardyne’s SPRINT-Nav Mini.

host high-end navigation systems. These include observation-class ROVs, low-logistic AUVs, manned submersibles, swimmer delivery vehicles and USVs operating in shallow waters.

The Mini family combines an INS, AHRS, pressure sensor and 500 kHz DVL in a single subsea housing that is just 215 mm high, 149 mm in diameter and as little as 0.7 kg in water.

Aidan Thorn, business development manager, Marine Robotics at Sonardyne, said, “The technology platform is low risk and field proven. This new flagship model will enable vehicle manufacturers and operators to enjoy all the benefits of Doppler inertial navigation from a single instrument.”

Available in 300 m and 4,000 m depth options, with a DVL altitude of up to 200 m, all SPRINT-Navs are supplied pre-calibrated from the factory, enabling users to install it and get to work easily and quickly. Existing owners of SPRINT-Nav Minis can upgrade their Guidance units to the new Navigator version, remotely in the field.

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# A LOT MORE POTENTIAL FOR SIERRA LEONE?

Sierra Leone has proven hydrocarbons in deep water cretaceous turbulent places and structural and stratigraphic plates in deep water settings, said Foday Mansaray, director general, Petroleum Directorate of Sierra Leone, while presenting the country's upstream exploration strategy at the Africa Oil Week's National Energy Showcase – Digital Edition. He highlighted the recent discoveries, ongoing activities and more. Deblina Roy reports.

**SIERRA LEONE HOSTS** highly prospective upper and lower cretaceous structural and stratigraphic plates, with light oil already encountering these intervals. “Regarding ongoing activities, we’re always constantly consulting with the industry in terms of how to simplify our process of licence acquisition. There’s 2D Long Offset 10,000 km proposed. Also, we have conducted an aerial survey of onshore basin and are currently working on an onshore legislation. The aim is to explore the full potential of our own exploration and production capabilities.”

There is abundant remaining potential within the oil and gas basins in Sierra Leone. Currently Sierra Leone has 145 graticule blocks. The average duration to drill a wildcat is 45-60 days with an approximate average cost of US\$40-50mn. The break even for any potential investor is US\$52 per barrel.

Speaking about the current offshore database, Mansaray said, “We have our data room in Freetown, Sierra Leone, as well as in London, with our partner TGS. Currently, we hold 15,780 km 2D; 9,976 sq km 3D; 16,000 km shipborne gravi-mag, 24,000 sq km airborne magnetic.”

To simplify licensing processes, Sierra Leone has removed red tape and bureaucracy. The Petroleum Directorate of Sierra Leone liaises with other departments to keep licensing processes as transparent as possible.

“The main focus of Sierra Leone is to attract IOCs into its petroleum basins. Once that is done, the Petroleum Directorate monitors, regulates and facilitates upstream activities on behalf of the state. We just finished the Fourth Offshore Petroleum Licensing Round in 2020, where two provisional licences were awarded to two companies: Cluff Energy

**“ Sierra Leone provides three types of licence: Reconnaissance Licence, Petroleum License (valid for 30 years: 7 year exploration period and 23 years of development and production) and permit of laying and operation of pipelines. Each licencing process typically takes four weeks from the letter of intent.”**



*Foday Mansaray is the director general of the Petroleum Directorate of Sierra Leone.*

Africa Ltd covering Blocks 23, 24, 25, 36, 37,38, 39, 54, 55, 56, 57, 74, 75, 94 & 95 and Innoson Oil and Gas covering Blocks 96, 97, 114, 115, 116, 117, 133,134 and 135.

“We have successfully concluded negotiations with Innoson Oil and Gas. Their agreement has been ratified by the parliament and they have started operations,” Mansaray commented. ♦

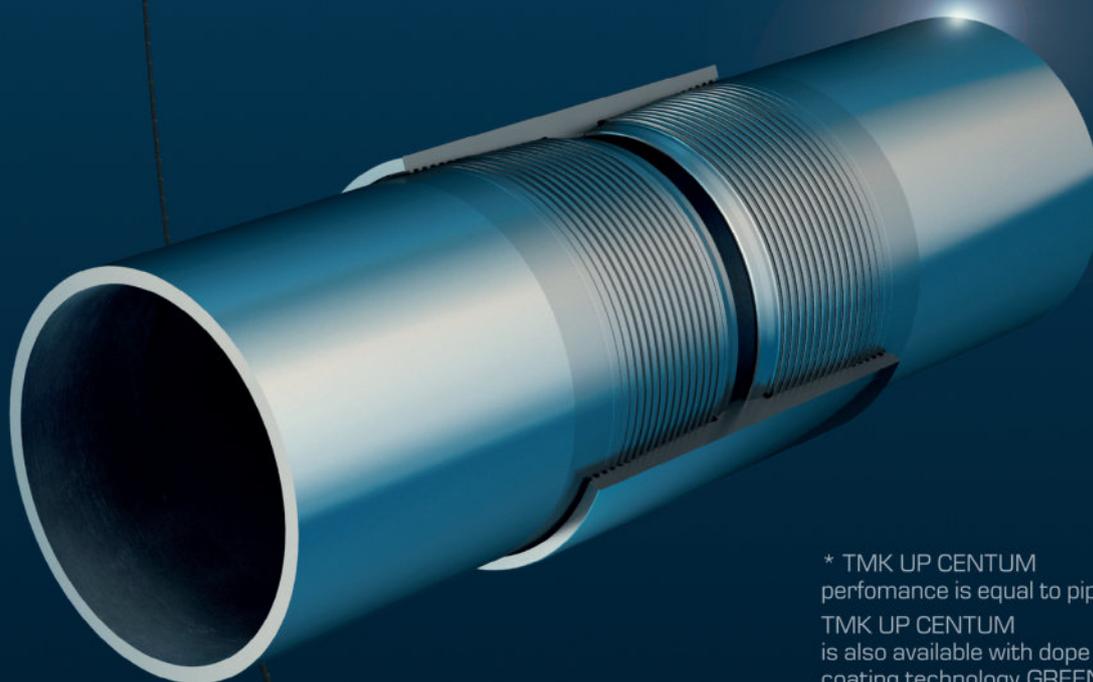


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