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Covering the Oil and Gas Industries

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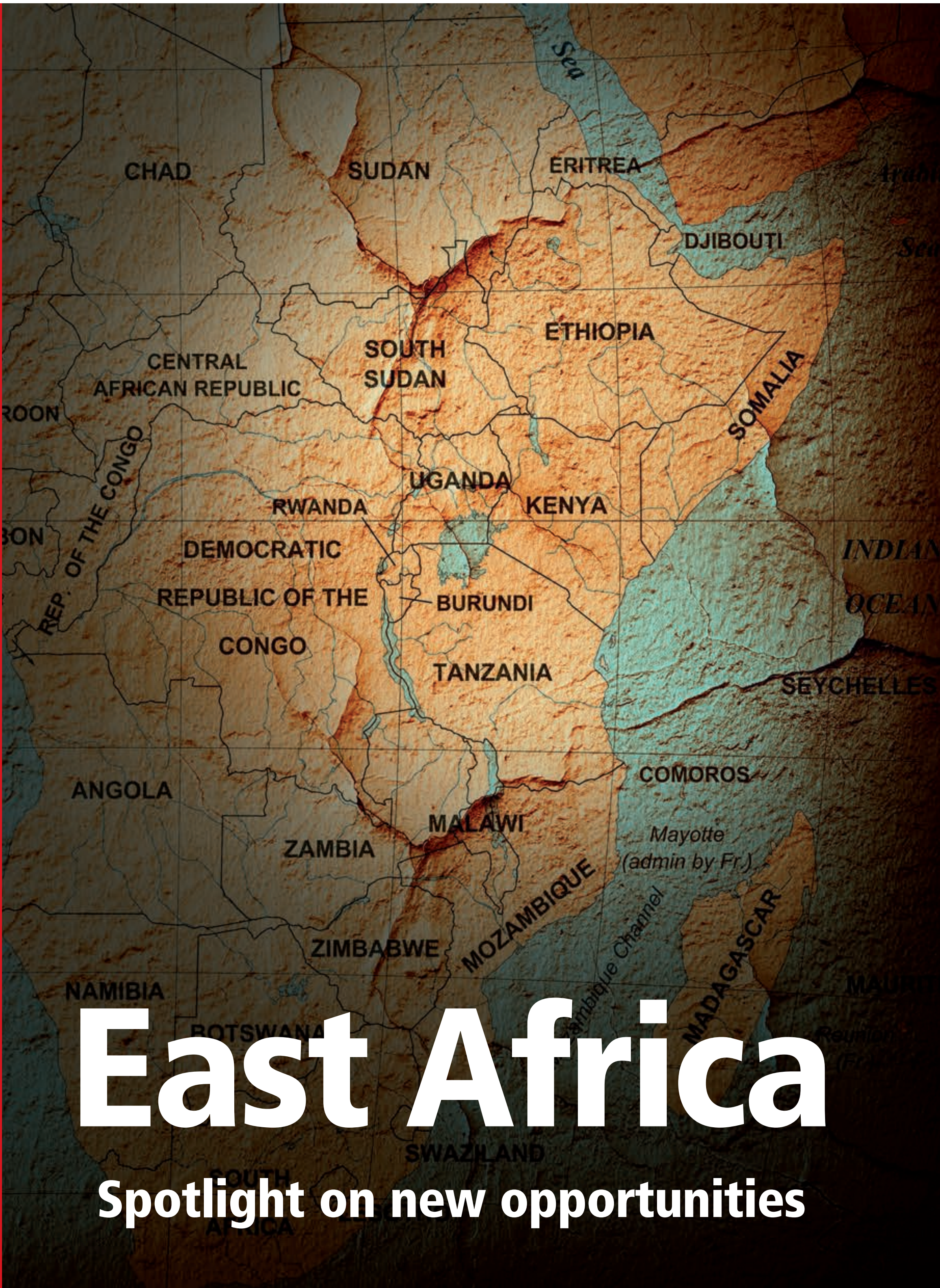
Dr Amy Jadesimi, managing director of LADOL. *See page 20.*



East Africa

Spotlight on new opportunities

REGULAR FEATURES: ■ News ■ Contracts ■ Events Calendar ■ IT update ■ Company profiles ■ Products & Innovations

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The opportunities for East African oil and gas are analysed in detail.

Editor's note

WE ARE FOCUSING heavily on the emerging East African markets of Kenya, Mozambique, Tanzania and Uganda in this issue with a special report on prospects for these four countries, as they seek to become bigger players in the African oil and gas landscape.

Mozambique, in particular, is keen to become a global player with its growing gas industry. In April, the capital city, Maputo, will be hosting the Mozambique Mining, Energy, Oil and Gas Conference for the fifth time. The event has been growing in stature every year and Oil Review Africa will be covering this year's conference.

Nigeria's gas industry is also analysed in this edition. The government is keen to develop its gas reserves as a means of diversifying its economy.

We also take a look at the prospects for hydrocarbons growth in South Africa. Currently a massive importer of oil and gas, the need to develop its own resources and build the necessary infrastructure has never been greater.

Elsewhere, we look at how African companies could be impacted by increased merger and acquisition activity. Every operator needs to manage big data to make big decisions – turn to page 30 to find out more. Please get in touch with us if there are any issues you would like us to cover in *Oil Review Africa*. Your feedback is always welcome.

Pemba in Mozambique is the site of a significant gas deposit. (Ton Rulkens/Flickr)

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New Ghana gas board sworn in

THE NEWLY APPOINTED members of the Ghana National Gas Company (Ghana Gas) were sworn into office at the country's Ministry of Energy and Petroleum. The five-member board will be chaired by John Armstrong Yao Klinogo, a chartered accountant, and also includes Alexander Mensah Moul, CEO of the Ghana National Petroleum Corporation (GNPC); Dr George Sipa-Adjah Yankey, CEO of Ghana Gas Awulae; Amihere Kpanyinli, Paramount Chief of the East Nzema Traditional Area; and Vivienne Gadzekpo, director of legal affairs at the Ministry of Energy and Petroleum.

At the ceremony, Emmanuel Armah-Kofi Buah, Ghana's minister of energy and petroleum, pointed out to the new board that one of the biggest challenges facing the national gas company is debt, and said that the Volta River Authority "does not pay for the gas it buys from the company as it ought to do."

Mr Buah said that the government is "using every tool at its disposal to tackle the situation" and that Ghana Gas, as a major stakeholder, has a "significant role to play" in resolving this issue.

Ghana Gas, Mr Buah added, has a crucial role to play in the country's "quest to improve its power generation capacity to address the deficit in the power sector." Power outages have been an ongoing problem since 2012.

Community support for gas operations was also cited in Mr Buah's address at the ceremony. He urged members of the board to be sensitive to the needs of communities where Ghana Gas operated.

"The company must initiate effective corporate social responsibility strategies to support the developmental needs," he said.

Mr Klinogo said the board members would utilise their expertise, which covers a range of sectors, to help improve the fortunes of Ghana Gas.

Britain-Petrofund joint venture in Namibia

THE BRITISH HIGH Commission in Windhoek and the Petroleum Training and Education Fund (Petrofund), established by the Namibian government, have signed a partnership that offers two jointly funded scholarships for promising Namibian students with an interest in pursuing a career in the Namibian oil and gas industry.

This partnership is part of the Chevening Scholarship Programme. The scholars will be given an opportunity to study petroleum-related masters degrees in the UK in the next academic year (2016-17).

The Chevening-Petrofund partnership offers scholarships to outstanding Namibian candidates who are willing and prepared to serve the Namibian oil and gas industry, upon completion of their studies.

Chevening is the UK Government's global scholarship programme funded by the Foreign & Commonwealth Office (FCO) and partner organisations. The programme makes awards to outstanding scholars with leadership potential from around the world to study fully funded postgraduate courses at UK universities. The scholarships cover tuition fees, a monthly stipend, travel costs and the opportunity to attend Chevening events in the UK.

The British High Commissioner to Namibia HE Jo Lomas said, "The scholarships align with our key priority in Namibia: supporting economic growth, including assistance in skills development."

Petrofund board of trustees chairperson and permanent secretary of the Ministry of Mines and Energy Simeon Niilenge Negumbo, added, "The partnership compliments Petrofund's Scholarship Programme since each party shall contribute to the costs associated with the scholarships equally." He believes this will provide an opportunity to marginally increase the overall number of candidates recruited for prestigious scholarship programmes.

IMF paints a mixed picture for Gabon oil

THE LEADER OF an International Monetary Fund mission to Gabon has spoken out on the impact low oil prices will have on the country's economy. Monfort Mlachila, the mission's leader and an adviser to the IMF Africa Department, described the collapse in oil prices as "a major test to Gabon's macroeconomic resilience."

Gabon's transport sector may be affected by oil prices. (Flickr/jbdodane)

"With oil production accounting for roughly one-third of GDP, contributing to 45 per cent of government revenues, and about 85 per cent of exports in 2014, the 40 per cent decline in international oil prices since 2014 is a serious shock to the Gabonese economy," said Mr Mlachila in a statement at the conclusion of the Libreville mission,

While economic growth in Gabon has been buoyed by oil production in recent years – and eight per cent growth is expected thanks to new wells and mature field productivity – Mr Mlachila cautioned that oil companies are "sharply curtailing exploration and operating expenditure", leading to a slowdown in other parts of the economy, such as construction and transport.

He recommended diversification of the Gabonese economy, stabilisation of the public banks, and the acceleration of structural reforms to improve competitiveness and attract investment.

New crude sale arrangement for Nigeria

NIGERIA HAS INTRODUCED a Direct-Sale-Direct-Purchase (DSDP) agreement, due to come into effect in March. Following on from the announcement by Nigeria's Minister of State for Petroleum and Group managing director of the Nigerian National Petroleum Corporation (NNPC), Dr. Ibe Kachikwu, that the country paid no subsidies on petroleum products in January 2016, the government expects the DSDP agreement to save the government $1 bn.

The DSDP agreement was adopted to replace the Crude Oil Swap initiative and the Offshore Processing Arrangement with the aim of introducing and entrenching transparency in crude oil product transactions in Nigeria.

The former arrangements meant crude oil was exchanged for petroleum products through third-party traders at a pre-determined yield pattern. However, the new DSDP arrangement means direct sales of crude oil by NNPC and direct purchase of petroleum products from credible international refineries are now possible, with the cost elements of third-part "middlemen" being eliminated, according to Dr. Kachikwu.

Any agreements that lead to substantial cost savings will be welcomed by NNPC, after the corporation announced a loss of $1.2 bn on its activities in 2015. The report, released in February 2016, recorded gross revenue for NNPC in 2015 at $10.3bn and expenses at $11.1bn during the same period.

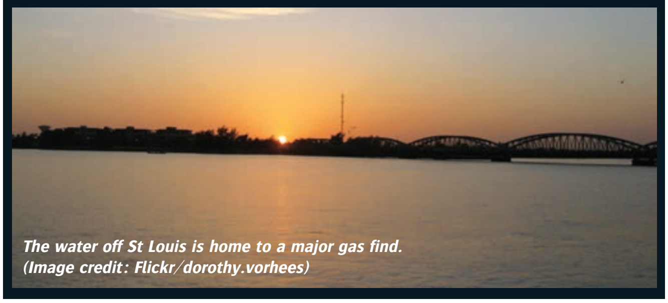
NNPC's Corporate Servic Unit, its three refineries, the Pipelines and Product Marketing Company (PPMC, a subsidiary of NNPC), and the National Engineering Technical Company (NETCO), all posted losses. However, there was some bright financial news for NNPC, with two parts of the corporation, the Nigerian Petroleum Development Company (NPDC) and the Nigerian Gas Company (NGC), recording profits for 2015.

A total of 254 bcf of gas was sent to power stations across Nigeria, generating 2,957 MW of electricity, and 7.5bn litres of petrol was supplied to the country by the NNPC and PPMC, in 2015.

Kosmos find off Senegal and Mauritania

KOSMOS ENERGY HAS announced the "significant" discovery of 450 bn cubic metres of gas off the coast of Senegal and Mauritania. The find is at the company's Guembeul-1 exploration well in the northern part of the Saint Louis Offshore Profond, which straddles the maritime border of the two countries.

However, it may take time for the site to be developed. Kosmos signed a memorandum of understanding with Petrosen and Societe Mauritanienne des Hydrocarbures et de Patrinomie Minier (SMHPM), the NOCs of Senegal and Mauritania, to develop the field, but a revenue-sharing formula has not yet been finalised. Additionally, there is regulatory uncertainty as the legislative framework governing the oil and gas industry in both countries is unclear or outdated. A renegotiated arrangement and more robust legislation will help make the find beneficial to all stakeholders, according to Kosmos.



The water off St Louis is home to a major gas find. (Image credit: Flickr/dorothy.vorhees)

Equatorial Guinea awards EPC contract

RIABA FERTILIZERS, WHICH was incorporated by the Ministry of Mines, Industry and Energy of Equatorial Guinea to develop the petrochemicals complex at Riaba on Bioko Island, has awarded an EPC to East China Engineering Science and Technology Company (ECEC), which leads a Chinese consortium.

The Riaba facility will utilise offshore gas reserves located to the east of Bioko Island. The complex will include an ammonia and urea plant, with petroleum capacity of 1.5 MTPA, as well as utilities, on- and off-site infrstructure, and a shipping jetty.

It is part of an Equatorial Guinea government initiative for industrialisation and energy diversification, known as the Petrochemicals Revolution (REPEGE).

Pre-FEED work has been completed by Worley Parsons, a British-based project management company, and a groundbreaking ceremony is expected to take place in late March.

The complex is expected to be completed in 32 months. A gas supply agreement is already in place with the Block O and I operator, Noble Energy, and partners, Gunvor, Atlas Petroleum International and Glencore.

"The Riaba petrochemicals complex demonstrates, once again, our commitment to building advanced and globally competitive industrial facilities," said Gabriel Mbega Obiang Lima, minister for mines, energy and industry, at the signing ceremony, which took place at ECEC headquarters in Beijing. "We would like to acknowledge the vital role of Block O and I gas producers in making this project a reality."

Forte Oil joins UN initiative for CSR

NIGERIAN PETROCHEMICALS COMPANY and energy solutions provider, Forte Oil, has signed up to the United Nations Global Compact (UNGC), a worldwide corporate social responsibility (CSR) initiative involving more than 8,000 companies and 4,000 non-business participants in 135 countries.

The UNGC signatories agree to align their core business activities, advocacy, and philanthropic activities with universal principles on environmental stewardship, anti-corruption activities, labour relations and human rights, for the advancement of the UN's global Sustainable Development Goals.

"We are very proud to be part of this global initiative that promotes what our company is very passionate about – conducting business in the most ethical and transparent manner," said Akin Akinfemiwa, group chief executive officer for Forte Oil. "The goals and ideals of the UNGC aligns with the vision of the company to use best practices as a tool for not only profitability but also to be a valuable corporate citizen in our immediate environment and the world at large."

As well as its petrochemical operations, Forte Oil has diversified and formed three subsidiary companies, AP Oil Field Services, AP Oil and Gas Ghana, and Amperion Power Distribution Company.

Forte Oil is the 14th Nigerian oil and gas company to join the initiative. Additionally, three Sudanese companies, two Ghanaian companies, and one company each from Mozambique and Zambia, are among the African hydrocarbons operators to sign up to the initiative.

The letter of commitment from Forte Oil includes an agreement to report on progress within one year of joining UNGC, with a statement from the CEO, a description of practical actions the company has taken to implement UNGC principles, and a measurement of outcomes.

Last year, the UNGC welcomed a letter from six major oil and gas companies – BG, BP, Eni, Royal Dutch Shell, Statoil, and Total – that made a public call for carbon pricing in an open letter to Laurent Fabius, President of COP21, last year's annual UN climate change summit.

The summit, which took place in Paris, resulted in the signing of an historic agreement to work towards reducing greenhouse gas emissions and limiting the global average temperature increase to no more than 1.5˚C.

News

Victoria Oil & Gas buys 75 per cent in Cameroon gas asset

VICTORIA OIL & Gas has reached an agreement with Glencore Exploration Cameroon Limited and Afex Global Limited to acquire a 75 per cent interest in Cameroon's Matanda production sharing contract (PSC).

Under the terms of the agreement, Victoria Oil & Gas will become Matanda's operator through its fully owned subsidiary Gaz Du Cameroun Matanda S.A. As a consideration for the assignment, the company or its subsidiaries will assume responsibility for a work programme to be agreed by the government of Cameroon.

Victoria Oil & Gas chairman Kevin Foo said, "This is a very exciting and fulfilling acquisition for Victoria Oil & Gas and its expansion plans. The North Matanda field has considerable potential and we believe is an extension of the Logbaba structure. At 1,235 sq km, the block is over 60 times larger than our existing concession.

"We believe the assignment and operatorship of the Matanda block is a major step towards allowing the group to meet the growing energy needs of the Cameroonian economy."

The North Matanda field is estimated to hold 1.8 tcf of gas and 136mn barrels of condensate.

Two new wells on the Logbaba field are also planned. Infrastructure plans include designs for the gas treatment plant capacity to rise to 40mm scf per day, adding 13km to the pipeline network and to develop new product areas such as compressed natural gas (CNG).

Eni gets nod to develop Mozambican offshore gas project

ENI HAS RECEIVED the government approval to plan the development of its offshore Mozambique Coral discovery.

The approval relates to the first phase of development of five trillion cubic feet of gas from Coral, which is located in the Area 4 Permit.

The plan of development, which is the first to be approved in the Rovuma Basin, foresees the drilling and completion of six subsea wells and the construction and installation of a floating LNG facility with a capacity of around 3.4mn tonnes per year.

Discovered in May 2012, Coral is estimated to contain around 16 tcf of gas in place.

Eni CEO Claudio Descalzi said, "The approval of the Coral plan of development is a historical milestone for the development of our discovery of 85 Tcf of gas in the Rovuma Basin.

"It is a fundamental step to progress toward the final investment decision of our project, which envisages the installation of the first newly built Floating LNG facility in Africa and one of the first in the world."

Eni is the operator of Area 4 with a 50 per cent indirect interest, owned through Eni East Africa (EEA), which holds a 70 per cent stake in Area 4. The other concessionaires are Galp Energia, KOGAS and Empresa Nacional de Hidrocarbonetos (ENH) with a 10 per cent stake each.

CNPC owns a 20 per cent indirect interest in Area 4 through Eni East Africa.

According to Eni, Mozambique is hoping to fuel future prosperity with revenue from an estimated 180 Tcf of offshore gas.

Africa Oil completes farm out deal with Maersk Oil in Ethiopiar

Africa Oil received a payment of US$12.8mn from Maersk Oil for the farm-out. (Photo: anita_starzycka/Pixabay)

AFRICA OIL CORPORATION has announced that it has completed a farm-out deal with Danish explorer Maersk Oil for the South Omo and Rift Basin Blocks in Ethiopia.

The transaction, which was previously announced in November last year, saw Africa Oil issued with a payment of US$12.8mn from Maersk Oil. The licenses cover about 100,000 sq km and include nine recent oil discoveries.

Following the agreement, Africa Oil and Maersk Oil each hold a 25 per cent interest in the Ethiopia Rift Basin and a 15 per cent stake in Ethiopia South Omo.

Africa Oil CEO Keith Hill stated in a company report, "We are pleased to have completed our farm-out to Maersk Oil. We feel Maersk Oil will be an excellent partner in terms of technical and financial strength."

According to the firm, four of the blocks are operated by Tullow Oil and one by Africa Oil.

Tullow Oil has described the region as one of its core areas of focus, with an estimated 2.3bn barrels of recoverable oil discovered to date.

Government crackdown on illegal refineries fuels kidnapping in Niger Delta

ON 11 FEBRUARY 2016, pirates hijacked a commercial vessel and kidnapped five crew members off Abidjan, the first such reported incident in Côte d'Ivoire since September 2014. The incident comes just two weeks after five crew members were seized from a Greek-owned chemical tanker 110 nm off Bayelsa on 29 January.

Since mid-January 2016, there has been a notable increase in such incidents in the Gulf of Guinea, with many of the incidents involving the kidnapping of crew. Four attacks on ships at sea that involved successful attempts of kidnappings in January, compared to one per month from October to December 2015. Although cargo theft remains a serious concern in the Gulf of Guinea, the rise in kidnappings could see piracy gangs target a wider range of vessels as they come to focus less on those carrying oil.

Nigeria President Muhammadu Buhari's crackdown on illicit refineries in the region has made it more difficult to process and sell stolen oil, disincentivising pirates from hijacking vessels for their oil. According to security officials, the Nigeria Security and Civil Defence Corps have destroyed 106 illegal refineries in the Niger Delta in 2015, most of which were shut down since Buhari came to power.

Improved navy patrols and surveillance in the Niger Delta have also made it more difficult for criminal gangs to store and transport stolen crude, prompting many criminals to operate further out to sea. These surveillance activities do not, however, appear to have had a significant impact on the rate of kidnappings within the Niger Delta, which remains high. Depressed oil prices have also made the sale of stolen oil significantly less profitable than was previously the case.

PGI reported that the ongoing fall in revenue to militant gangs from oil theft and amnesty payments will continue to incentivise criminal activity at sea, resulting in a steady increase in kidnappings of the crew of commercial vessels.

Executives Calendar 2016

MARCH			
7-19	**ASME Hydraulic Fracturing Conference and Exhibition**	HOUSTON	www.asme.org
15-17	**CAPE VI, 6th African Petroleum Congress and Exhibition**	ABUJA	www.cape-africa.com
15-18	**WPC 16: 31st World Petrochemical Conference**	HOUSTON	www.ihs.com
27-28	**Moving Safety into the Boardroom**	DUBAI	www.hse-forum.com
28-29	**East Africa Oil & Gas Summit**	DAR ES SALAAM	www.eastafricaogs.com
APRIL			
6-8	**Africa Upstream 2016**	ACCRA	www.africaupstream.com
11-15	**LNG 18**	PERTH	www.lng18.org
12-13	**Tank World Expo**	DUBAI	www.easyfairs.com
19-21	**MOC Mediterreanean Offshore Conference & Exhibition**	ALEXANDRIA	www.moc-egypt.com
20-21	**Ghana Summit**	ACCRA	www.cwcghana.com
24-26	**Big Data Analytics for Oil & Gas**	ABU DHABI	www.oilandgasbigdata.com
27-28	**MMEC (Mozambique Mining, Oil & Gas and Energy)**	MAPUTO	www.mozmec.com
22-24	**The Ghana Summit – Oil, Gas & Frontier Markets**	ACCRA	www.thecwcgroup.com
MAY			
2-5	**OTC 2016 (Offshore Technology Conference)**	HOUSTON	2016.otcnet.org
25-26	**14th Africa Independents Forum**	LONDON	www.africa-independentsforum.com
JUNE			
10-12	**5th East Africa Oil & Gas Exhibition and Conference**	NAIROBI	www.expogr.com
13-16	**Nigeria Oil & Gas Conference & Exhibition (NOG 2016)**	ABUJA	www.cwcnog.com

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

Multiple discoveries are definitely a boon for East Africa, but with ongoing low oil prices, timing is a critical factor. According to analysts, existing oil economies are struggling and new investments may be hard to come by, but the future still looks bright in many areas. Rhonita Patnaik reports.

Companies eye East African opportunities

East Africa is finally emerging as a significant player in the oil and gas industry. (Photo: Anthony Goto/Flickr)

OVER THE PAST five years, East Africa has emerged as an exciting prospect for energy companies. Mozambique and Tanzania have been the most sought after, due to large natural gas finds in the Rovuma Basin off the south-east African coastline. Meanwhile, Uganda and Kenya have attracted attention for onshore oil discoveries. However, low oil prices will not only put the profitability of these projects in doubt, but oil companies will have fewer resources to finance large-scale investment projects.

KPMG's latest study suggests that this could weaken the medium-term prospects for prospective oil and gas producers. This is especially a concern for East Africa, since billions of dollars' worth of investment will be needed over the next decade to commercialise the region's hydrocarbon resources.

In contrast, two leading analysts for Rystad Energy, Espen Erlingsen and Audun Martinsen, named Mozambique and Tanzania as the two countries expected to lead the way in African hydrocarbons growth in the coming years.

Erlingsen and Martinsen also made the prediction that by 2017, oil prices will have risen to US$80 a barrel.

On a global level, Africa was named by Erlingsen, Rystad Energy's VP Analysis, as the continent with the largest oil and gas discoveries, along with South America.

Martinsen said that growth in the West African oil countries was "disappointing" with no big developments planned and big players, such as Total and Shell, conserving cash. However, he said that in 2016, Mozambique and Tanzania will be the countries to watch with big gas projects expected to come online in 2016. Offshore projects, such as Coral in Mozambique, Bonga in Nigeria, Zohr in Egypt, and SNE in Senegal, are also expected to be sources of growth, according to Martinsen.

"Growth in [the discovery of] resources has not been mirrored by a growth in production [but] the exploration challenge is to find new oil and gas fields," said Dr Alastair Milne, vice-president exploration, sub-Saharan Africa, for Shell, when he spoke at International Petroleum Week in London in February.

He said that in countries such as Mozambique, Tanzania and Uganda, newly discovered resources can "jump the gun in terms of becoming production-ready", ahead of older projects that may be lagging behind.

Dr Milne added that it is important to identify those where investment is needed to bring on development against a lower-for-longer backdrop of oil prices, and advised countries seeking further investment in oil and gas to provide "transparent, effective governance" and to balance local content programmes with meeting the needs of the business.

Mozambique's gas reserves, discovered in 2010, could contribute to making the country one of Africa's largest economies by 2028, when its gas production is to reach its peak, according to the International Monetary Fund (IMF).

Mozambique discovered 180 trillion cu/m of natural gas deposits in the Rovuma River Basin in the northern province of Cabo Delgado. The volume is equivalent to Nigeria's entire national gas reserves. The two operators — US company Anadarko and Italy's Eni are presently developing plans to build LNG plants to market the gas with a total investments amounting to more than US$100bn, according to another report. The production from the gas field is scheduled to begin in 2021 and Mozambique could supply half of its energy needs from natural gas by the mid-2020s, the IMF cited.

The IMF also projected that Mozambique could become the world's third largest gas exporter after Qatar and Australia. The Mozambican economy is expected to grow 24 per cent between 2012 and 2025, before falling back to the three to four per cent growth as late as 2028.

Tanzania, the largest country in East Africa, geographically, has discovered 1.43 trillion cu/m of gas, which is among the largest in the world. Kenya is estimated to have found over 600mn barrels while Uganda has over 6.5bn barrels of oil reserves. Kenya and Uganda are expected to start the process of oil commercialisation in 2017 while Tanzania's is expected to start producing gas in 2019.

The discoveries have the potential of speeding up economic growth and development by attracting investments in roads, railways and other infrastructure projects.

PineBridge Investments East Africa senior investment manager Edward Gitahi said that East Africa has been less impacted by the weaker global commodities prices. "We expect the East Africa region to grow on average by six per cent in 2016 compared to southern and western Africa region, which is expected to grow by between three and four per cent," Gitahi said.

Gitahi added that the East African economies were resilient in 2015, and are expected to remain so in 2016.

East Africa covers a territory roughly six times the size of the North Sea but fewer than 600 wells have been drilled in the region to date. The reserve estimates in the region have increased rapidly over the past few years and yet only a small percentage of the region has been properly explored.

The market has changed too, as major international companies are becoming involved alongside smaller companies, thus indicating the industry's confidence in East Africa's immense potential.

Mozambique and Tanzania's substantial offshore gas reserves and proximity to Asian demand centres offer the potential for LNG export by the end of the decade

According to East African Oil & Gas Market 2015-2025, Mozambique and Tanzania's substantial offshore gas reserves and proximity to Asian demand centres offer the potential for LNG exports by the end of the decade, while Uganda and Kenya present opportunities for commercial oil production even sooner. With a significant amount of seismic activity and exploratory drilling already taking place, and plans for large midstream infrastructure projects, the East African oil and gas market should attract tens of billions of dollars of investment over the coming decade.

The report by UK-based business intelligence firm Visiongain said the region could see a capital expenditure (capex) of US$4.19bn in 2015 alone, including spending on both upstream exploration and development and midstream infrastructure.

Kenya's oil and gas market will see capex of US$482mn in 2015, according to the report. "Strong development of both onshore and offshore exploration and production over the next few years, along with midstream spending on pipelines, a refinery and a floating storage and regasification unit will lead to a compound annual growth rate (CAGR) of 36.5 per cent during the first half of the forecast period and spending of US$2.285bn in 2020."

The report added that the spending will drop off once commercial production has been achieved, with a CAGR of -21.3 per cent during the second half of the forecast period and capex of US$691mn in 2025.

In Ethiopia, upstream exploration and development and midstream capex is expected to rise from US$47mn in 2015 to US$432mn in 2025.

In August 2014, the UK Trade & Investment (UKTI) agency said that it was encouraging UK firms to take advantage of export opportunities to win new business emerging from Africa's developing oil and gas industry. UKTI said it would target major investment projects and smaller and shallow water fields, with a focus on providing support to firms that have recently acquired major independent oil company assets.

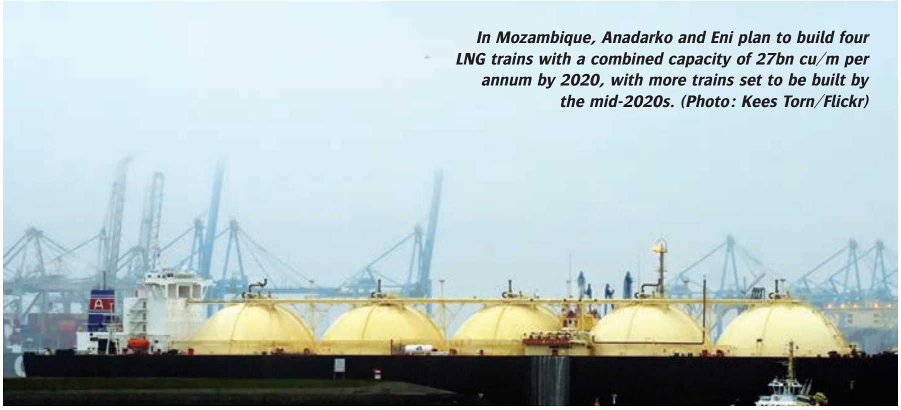
Last October, the World Bank and other international institutions pledged a combined total of more than US$8bn in new financial assistance to support infrastructure projects including the development of oil and gas pipelines across all eight countries in the Horn of Africa, including Kenya.

According to the World Bank, net foreign direct investment inflows to sub-Saharan Africa increased by 16 per cent to a near-record US$43bn in 2013, boosted by new oil and gas discoveries in many countries including Angola, Mozambique and Tanzania.

A slew of foreign investments

Reports pointed that deal-making in East Africa's natural resources sector slumped in 2015 due to the falling price of commodities in the international market.

The annual financial review by Burbidge Capital shows that the number of deals in the mining, oil and gas sectors halved due to the poor market.



In Mozambique, Anadarko and Eni plan to build four LNG trains with a combined capacity of 27bn cu/m per annum by 2020, with more trains set to be built by the mid-2020s. (Photo: Kees Torn/Flickr)

"2015 was a low year for the natural resources sector in East Africa as investor interest decreased, with around half the number of deals announced compared to 2014. The number of deals fell to 23 in 2015 with Kenya accounting for almost 50 per cent of the total deals recorded in the sector," said the report.

The number of deals in the oil and gas sector reduced to nine in 2015 from 14 a year earlier although the energy sector was the most vibrant driven by interest from private equity and venture capital firms.

The IMF has projected that Mozambique could become the world's third- largest gas exporter after Qatar and Australia

Africa Oil, partner of Tullow Oil in Kenya, has received US$427mn from Maersk Oil & Gas of Denmark in exchange for half of its stake in three exploration blocks located in the Lokichar Basin.

The deal brings in Maersk as a partner in Blocks 10BB, 13T and 10BA where it will own 25 per cent interest, scaling down Africa Oil's stake to 25 per cent while Tullow Oil retains a 50 per cent interest in the blocks. Africa Oil said the funds will be utilised to further exploration activity ias it prepares to commence pumping crude and it will be eligible for an additional US$75mn from Maersk after it confirms the existing amount of crude in the three blocks, which is expected to take place in Q1 2016.

The Kenyan government is aiming to start crude production in September 2016 but in a recent update on its operations, Tullow Oil said that it would consider whether to invest in oil production and setting up of associated infrastructure in 2017. Africa Oil is upbeat that the deal with Maersk will eliminate the need for funding from its shareholders.

Canada-based Octant Energy entered into three agreements with subsidiary companies of Afren to acquire assets in Kenya and Tanzania. The assets acquired include Block L17/L18 and Block 1 in Kenya, and the Tanga Block in Tanzania.

The acquisition is important for the development of these assets and the region, following Afren going into administration earlier this year. The deal ensures that a team with regional experience and knowledge takes forward the respective production sharing contracts (PSC) and continues delivery of near-term actionable items on these assets.

Richard Schmitt, president of Octant Energy, said, "This portfolio that Octant Energy has secured is pivotal in the future development of Kenya and Tanzania as they further move towards energy security and domestic growth. For me, being a part of East African growth and development again is a great opportunity and privilege."

The government of Mozambique, last year, awarded Eni, Statoil, Sasol and ENH exploration and development rights of the offshore block A5-A. The award was made following the 5th Competitive Mozambique Bid Round, and the offshore block A5-A is in the Angoche area of Mozambique, about 1,500 km northeast of the capital, Maputo. The block covers a total area of 5,145 sq km in water depths between 200 and 1,800 metres, and it is placed within an unexplored area of the Northern Zambesi Basin, which, according to estimates made by the consortium, contains significant hydrocarbon resources.

According to a report by *Reuters*, Mozambique has awarded exploration contracts to ExxonMobil, Eni and Sasol for 15 blocks in both onshore and offshore fields. The area of these awards is said to be about 74,250 sq km and includes blocks around the northern Rovuma Basin where Eni is building an LNG export facility.

Eni has been present in Mozambique since 2006 and is the operator of Area 4 with a 50 per cent indirect stake, owned through its subsidiary, Eni East Africa.

Australia-based Swala Energy (Swala) has announced receiving an extension for drilling exploration wells in its two licences in Tanzania. Tanzania's Ministry of Energy and Mining has agreed to extend the period within which an exploration well must be drilled in each of the KilosaKilombero and Pangani licences to 20 February 2017. This one-year extension is to be deducted from the four-year additional exploration extension period currently due to commence on 20 February 2016, resulting in the additional exploration period being shortened to three years.

From Indian subcontinent to African continent

Swala Energy subsidiary Swala Tanzania reached an agreement with India's Tata Petrodyne (TPL) to farm out the Pangani and Kilosa-Kilombero

East Africa

licences in the East African country. Under the terms of the agreement with TPL, on receipt of Tanzania's governmental approvals for the transfer of interest TPL will pay Swala Tanzania US$5.7mn for a 25 per cent equity interest in both interests.

The Indian company will also carry Swala Tanzania's costs of the initial well on the Kilosa-Kilombero licence, up to a maximum of US$2.5mn, and the costs of the initial well on the Pangani licence, up to a maximum of US$2.125mn.

Layoffs are common today due to lower oil prices. But Eaves reiterated that job security can never be ensured in any organisation

TPL is expected to pay Swala Tanzania up to a further US$1mn towards the cost of a second well following a commercial discovery in the initial well on the Kilosa-Kilombero licence.

India's ONGC, Oil India Limited (OIL) and BPCL look to invest US$6bn to develop a gas field offshore Mozambique. The three Indian oil majors hold a 30 per cent interest in Rovuma Area-1, estimated to hold recoverable gas reserves of up to 2.1 trillion cu/m. The first export of LNG from the block is targeted for 2018-end or early 2019. The project, with a capacity to produce 20mn tonnes of LNG annually, would be the world's largest LNG export site after ExxonMobil-run Ras Laffan in Qatar.

Now, the three-block consortium is in talks with Indian buyers such as GAIL to sell the LNG produced at Rovuma. The offshore Mozambique block (Block Area 1) is located along the coasts of northern Mozambique and southern Tanzania in the Indian Ocean. It has a total area of more than 10,000 sq km in water depths ranging 900 metres to 1,600 metres and 30-60 km from shore.

Assets protection

UAE-based risk management company Olive Group launched a new joint venture company in Mozambique in January 2016 with two local firms, with the aim of providing a full range of security services for the giant Rovuma Basin LNG projects.

Olive Group, which has a special focus on oil and gas security management, is joining up with Arkhe Risk Solutions and Executive Logistics, Olive Group's East Africa head Rob Andrew said.

Arkhe Risk Solutions is one of the biggest suppliers of security guards in Mozambique, protecting, among other things, most of Maputo's foreign diplomatic missions. Executive logistics has a long history of operations and security management in the country, particularly in the maritime sector, and has already had a role protecting offshore gas exploration in the country.

Olive Group brings experience in the LNG sector, having won a five-year US$150mn security contract for the Ras Laffan LNG plant in Qatar, currently the world's largest LNG exporter. It hopes to pick up similar work for Eni and Anadarko's projects in Mozambique.

Mozambique poses a "medium to low security risk", Andrew told *Zitamar News*, but "from the get go, you're going to have to plan and put in place a minimum level of security procedures that can be increased and upgraded in the event that the threat goes up.

"It would be intolerable for an investment of this nature and for investors to consider that there will be any holes left that can be exploited by an ISIS type group or Somali pirates operating at range," Andrew added.

"The issue is you have a US$25bn project in a remote part of the country, which is two hours by air from Maputo, with very little infrastructure to support it and which will be at risk because it's close to the border of Tanzania, which is porous. The communications structures are inadequate at the moment to cope with the demand of a massive EPC project of this scale," he said.

"Inevitably there's a political risk, but I wouldn't say it's a security risk," said Andrew. "The scale of the operation is so significant it's going to require technical and security support from the Mozambican authorities. The complex aspect of it will be trying to integrate all those processes as quickly as the development takes shape in order to produce a joined up, co-ordinated and effective security blanket around the operations. I don't think internal factors are going to impact that, I think it will be external."

There has been some piracy off the coast in Mozambique, although not in recent years. The last attack, not far from the Quirimbas archipelago off the coast of Cabo Delgado, was in 2011. While Somali piracy has seriously tailed off since 2012, LNG tankers loading at Palma could still be vulnerable to attack.

"Looking after the sea space immediately around the LNG site and the jetties will be an important part of the security plan that has to be put in place," said Andrews.

Skillset

Also speaking at International Petroleum Week, Sonja Palm, programme director of employment, development and skills for oil and gas in Africa for GIZ, an international development specialist, said that there is 'global momentum for job creation and local content'.

"The challenge is for East African countries that have experienced double-digit growth but no corresponding rise in job creation to 'make sure local economies benefit," Palm added.

Growth in 'indirect services' that gain from oil and gas development such as catering, security, staff accommodation and waste management is important according to Palm.

In Uganda, for example, OGAS Solutions uses a local supplier of safety equipment to

One of the main obstacles for job growth in the East African oil and gas industry is matching skills to labour market needs (Photo: Wikimedia Commons) meet its needs for products such as helmets for site workers.

She said that the main obstacles for jobs growth in the East African oil and gas industry were issues with matching skills to labour market needs; a lack of basic skills among more than one-third of people living in sub-Saharan African countries; and university education that focuses on public sector employment rather than the needs of the private sector.

However, Palm cited the examples of companies such as Tullow Oil, Statoil, Sasol, Shell and Rio Tinto in using oil and gas development as a driver for growth, coordinating local people with employers, and developing transferable skills for low-skilled workers to broaden their employment options.

Airswift, an international workforce solutions provider within the energy, process and infrastructure industries, also spoke about the need to better the skillset industry for oil and gas sector in East Africa.

Terry Eaves, area director for Mozambique at Airswift, said, compared to other areas of the continent, education and skill levels are very low in East Africa.

Due to local content laws, a sizeable percentage of investment must be delivered locally and there is a clear need to invest in education and training to establish a skilled workforce.

> Even though East Africa has been at the forefront of new oil and gas discoveries, a number of challenges remain including securing expat work visas, security and community awareness

"It is estimated that around 25,000 people will require technical and vocational training or higher education to achieve these investment goals in Mozambique alone."

Talking about the main challenges local and international companies face in the region, Eaves said that even though East Africa has been at the forefront of new oil and gas discoveries, a number of challenges remain. These include securing expat work visas, security and community awareness – which all need to be considered before production.

"Governments and oil and gas companies need to work together to ensure that local stakeholders' interests are adequately addressed," he added.

Layoffs are common today due to lower oil prices, which are set to stay in the long-term.

But Eaves reiterated that job security can never be ensured in any organisation. "In an attempt to reduce costs, companies are cutting contractor day rates by 15 to 20 per cent. Travel expenses such as business class flights have been changed to the cheapest economy fares, and benefits such as company cars are being reduced with many staff now sharing vehicles in remote locations. These actions will help to protect jobs and ensure projects already committed to are completed."

According to the area director, even with the downturn now there is a huge potential in East Africa for job opportunities with a number of major projects almost at the starting line.

East Africa covers a territory around six times larger than the North Sea, but only has roughly 600 wells drilled to date. Just a small section of the region has actually been properly explored. "The market in East Africa is changing though, as major companies are becoming involved, indicating the industry's confidence in the region's potential. However, until the oil price increases significantly — to between US$60 and US$70 — most projects will run with a skeleton workforce." ■

Nigeria's gas industry has great potential to boost the country's economy. Moin Siddiqi analyses the challenges on the road ahead.

Montetising Nigerian gas
The challenges ahead

W*OOD MACKENZIE, THE* UK energy consultants asserted in 2008, "Nigeria is actually a gas province which has some oil" and this is still correct. With 180-182tcf of natural gas, Nigeria boasts Africa's biggest reserves and the ninth largest worldwide. At current production levels, reserves should last 155 years compared to 42 years for oil, according to Nigerian National Petroleum Corporation (NNPC)

Untapped resources

Nigeria sits on huge quantities of 'stranded gas' because of physical or economic factors. Thus Nigeria is only in 22nd spot among dry natural gas producers with 2014 output reported by BP at 38.6bcm. Reserves have not been exploited fast enough to keep pace with domestic demand.

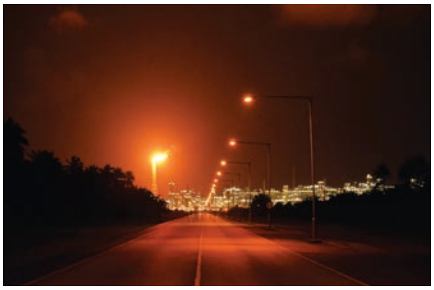
The bulk of gas produced by Nigeria is exported as LNG, mainly to Asia-Pacific, which in 2014 totalled 25.3bcm. This represented 7.6 per cent of globally traded LNG, making Nigeria the world's fourth-largest LNG exporter. The country's only LNG producer in is Nigeria LNG (NLNG) on Bonny Island. NLNG is owned by four shareholders, the Federal Government of Nigeria (48 per cent); Shell (25.6 per cent); Total LNG Nigeria (15 per cent); and Eni (10.4 per cent). Its maximum capacity, from six trains, stands at 22mt/year. Meanwhile, a seventh train is under construction to hike capacity above 30mt/year.

Low investment in gas projects, along with most oilfields lacking infrastructure to produce and market gas, has led to flaring, costing US$3bn in revenues annually. But Nigeria is no longer the world's biggest gas-flarer. Companies are fined US$0.60 per mcf of gas flared, but the Petroleum Industry Bill (PIB) proposes raising penalties to US$3.5 per mcf. PIB was drafted in 2008 and is not yet law. Despite slow progress, Nigeria still aims to appeal to investors.

The important role of gas-to-power

Current volumes of natural gas supplies (8.25bcf/day) and generational capacity are insufficient to meet the country's energy needs. Thus, Nigeria is shifting the emphasis on monetising untapped gas as part of an overhaul of electricity sector. Gas in Nigeria is high grade, sweet and rich in liquids, ideal for supplying power stations. The government aims to double electricity generating capacity within a decade.

After the Nigerian electricity privatisation in 2013, the Gas Aggregation Co. of Nigeria (GACN) was created to act as an intermediary between gas producers and independent power producers (IPPs), with a view to harmonising the price nationwide and ensuring that supplies are adequate to meet gas demand from power plants, which is forecast to reach 3.5bcf/d by 2016, up from 1.7bcf/day in 2013, according to GACN.



The Bonny Island LNG facility. (Image credit: Flickr/Chike Roland Oraekwugha)

To incentivise new production, the domestic gas price was raised from US$1 in 2013 to US$2.50 per mcf by end-2014. Producers after fulfilling their domestic power supply obligations can sell excess gas at market prices.

IPPs under construction include ASEA Brown Boveri's 450MW gas and steam turbine in Abuja, and ExxonMobil's 388MW gas-fired plant in Bonny Island. Domestic market obligations surged more than two-fold between 2008 and 2013 to 5.15bcf/day, of which Shell Petroleum Development Company (SPDC) was reportedly accounting for around two-fifths of aggregate.

Based on NNPC estimations, domestic demand should hit more than 10bcf/day by 2020 with about 75 per cent of demand expected to come from the power sector. Nigeria plans to expand generating capacity to more than 20,000MW by 2020. The National Integrated Infrastructure Master Plan (NIIMP) proposes increasing production capacity to 11bcf/day, 15bcf/day and 30bcf/day, by 2018, 2023 and 2043 respectively. This is to keep power stations supplied and develop energy-intensive industries such ascement, steel, and petrochemicals.

Gearing up for new production

The government hopes higher domestic prices (closer to the standard export rate) will encourage producers to increase gas output and invest in new exploration and extraction projects, which is gradually happening in Nigeria. The DPR vets all new upstream oil-gas projects and prevents them from proceeding without proof of a concrete gas monetisation programme. SPDC has two projects underway, at a cost of US$2bn, to cut gas flaring by 95 per cent, and these are due online by 2017.

The Southern Swamp Associated Gas Solution Project will add 100mcf/day to domestic supplies, fed through the Escravos-Lagos Pipeline System, and the Forcados Yokri Integrated Project will yield 80mcf/day of treated gas extracted from shallow-water associated gas.

Also, SPDC plans to develop the US$3.5bn Assa-North/Ohaji-South gasfields in Imo State – which contingent on a final investment decision (FID) – will add 1bcf/day to domestic supplies on the eastern pipeline system. In mid-2013, FID was taken by SPDC on phase two of the Gbaran-Ubie Project to supply feedstock for NLNG and Gbaran-Ubie IPP, and Trans-Niger Pipeline Loop-line for carrying gas liquids from the south-east to Bonny. Both projects are expected online in 2017.

Chevron, is involved in the development of the Escravos Gas Plant (EGP), the Escravos Gas-to-Liquids (EGTL) facility and the Sonam Field Development Project. Production is expected by 2017. The EGP scheme aims to eliminate flaring.

The US$10bn EGTL facility, which came onstream in June 2014, is designed to convert 325mcf/day of natural gas into 33,200 bpd of liquids, principally synthetic diesel for cars and trucks. The plant's long-term capacity could be expanded to 120,000 bpd according to sponsors.

Some local companies are bringing gas to market. Seven Energy, in collaboration with Frontier Oil, has built a 100mcf/day gas plant on the Uquo marginal field containing only natural gas. Seplat Petroleum invested US$300mn to expand its 90mcf/day Oben plant by 150mcf/day, while drilling two new wells a year until it hits production capacity of 350-400mcf/day. Seplat signed a 15-year agreement to supply 160mcf/day to the 450MW Azura-Edo IPP.

Local operators estimate that a price of US$4-5 per million Btu is needed to cover exploration, development and infrastructure costs. The cost of new schemes outside the south-east, where infrastructure is undeveloped is higher, making most potential projects unviable. But gas industrial hubs are planned, such as a new 2,800-hectare, gas-based free trade zone in Delta State.

The NGA estimates US$55bn is needed for monetising gas, of which one-third should be earmarked for Niger Delta development and the rest invested in processing plants, pipelines, power transmission and distribution networks to the west and north. ■

Because He founded the earth upon the waters...
And four fifths of the earth is under water

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Moin Siddiqi reflects on the current state of play in the global oil market and reflects on what might lie ahead in the coming years, especially if prices stay low, and what this means for the growth of the oil industry in Africa.

Torrid times ahead for the world oil market

Will Africa prevail?

High-cost deepwater fields in Angola, as well as Nigeria and the Gulf of Mexico, currently account for more than half of the deferred big-ticket projects, according to Wood Mackenzie. (Image credit: Flickr/nathanhj)

THE OIL INDUSTRY faces ongoing uncertainties in 2016, including effects of China's slowdown on global fuel consumption growth; the pace and volume at which Iranian oil re-enters the market; the impact of geopolitics and excessive market speculation; environmental concerns; advances in light tight oil (LTO) extraction technologies and their impact on exploration and production; and the responsiveness of OPEC's kingpin, Saudi Arabia, and important non-OPEC producers, namely the US and Russia; and the depressed investment climate.

During the past five years, spot crude prices have hit highs of more than $120/ barrel and lows of below US$3. Estimated losses to sub-Saharan Africa's oil-producing countries, led by Nigeria and Angola, are put at US$63bn or higher. The slump has contributed to a downward revision to real GDP growth in Africa for 2015, to 3.5 per cent, according to the International Monetary Fund (IMF), compared to 5.2 and 5 per cent, respectively, in 2013 and 2014.

The US-led shale boom driven by fracking and horizontal drilling technologies, has added about 4.2mn bpd to the market, contributing to a mega-glut. Inventories in developed economies have swollen to 3bn barrels, according to the International Energy Agency (IEA) – a record and ample to supply worldwide needs for over a month. This stock build is putting storage infrastructure under increasing pressure. Bloated inventories must first decrease before any sustainable price rally takes place.

The current values of futures and options contracts suggest high volatility in the oil price outlook.

Meanwhile, OPEC's over-supply continues unabated as Saudi Arabia and Iraq combined have added about 1mn bpd during 2015. Iran could boost output by 0.5-0.7mn bpd, potentially reaching a 2011 pre-sanctions level of 3.6mbpd – hence delaying the rebalancing of oil markets in 2016. At that point, Saudi Arabia, traditionally a swing producer, must decide either to accommodate Iran by cutting its output or keep fighting for market share.

The greenback's strength – boosted by expectations of further hikes in US interest rates – raises local currency costs of oil imports in countries that are not pegged to the dollar, making for weaker demand in those countries.

Supply and demand dynamics

OPEC envisages more balanced supply and demand fundamentals during 2016. The cartel's secretary-general, Abdalla Salem El-Badri, said: "We see global oil demand maintaining its recent healthy growth. We see less non-OPEC supply. And we see an increase in the demand for OPEC crude."

Fitch Ratings observed: "While the gap between oil supply and demand appears to have peaked at 3mn bpd in second-quarter 2015, the market is unlikely to balance until second-half of 2016 at the earliest when it will still have to digest elevated oil stocks. We have therefore effectively pushed back the slow recovery we had assumed by one year, and now include a modest price recovery only in 2017."

At the time of writing, 2016 forecasts for world oil demand growth vary from the US Energy Information Administration (EIA) 1.42mn bpd versus OPEC and IEA estimations of 1.26mn and 1.2mn bpd, respectively.

Demand in non-OECD regions is projected to grow by 1.1mn bpd, reflecting gains notably in India and China, thus offsetting sluggish fuel consumption in advanced economies.

EIA projects 2016 global supply (including liquids) at 95.93mn bpd – almost static over the previous year – due to declines in US onshore and North Sea production, which would represent the first annual drop in non-OPEC supply (estimated at 0.6mn bpd) since 2008 . But OPEC's output is forecast to rise by 0.5mn bpd to 32.16mn bpd – on account of increased Iranian exports thanks to the lifting of international sanctions.

The global supply glut – driving factor behind the price slump – should fall from last year's highs of 1.94mn bpd to 0.74mn bpd in 2016 – hence leading to a slower inventory build-up during the year – which is estimated at about 400,000 bpd.

The current values of futures and options contracts continue to suggest high volatility in the oil price outlook, though prices are now unsustainably low driven mainly by heavy speculative selling and perceived fears of severe global economic downturn similar to 2009 that, however, appears unlikely.

Exploration budgets slashed

According to energy consultants, Wood Mackenzie, $380bn of upstream capital expenditure (capex) for 68 big-ticket projects – with potential output of 2.9mn bpd – have been shelved since 2014. High-cost deepwater fields, mainly in Angola, Nigeria and the Gulf of Mexico, which require vast upfront investment, account for over half of that deferred production. Angola comprises one-fifth of the delayed spending.

Concurrently, very few projects are now receiving final investment decisions (FIDs) – analysts reckon barely half a dozen could be approved in 2016, compared to an annual average of 50-60 over recent years.

Some firms have also reduced capital expenditure on existing oilfields, including on enhanced oil recovery or infill drilling techniques that are deployed to offset natural declines.

The IEA estimated that oil-related investment during 2015 fell by one-fifth – the steepest decline in history – a similar trend could persist this year. Annually $630bn in global hydrocarbons investment – representing the total amount the industry spent on average in the past five years – is needed just to compensate for depleting volumes at existing fields, thereby keeping future production flat at today's levels, according to the IEA.

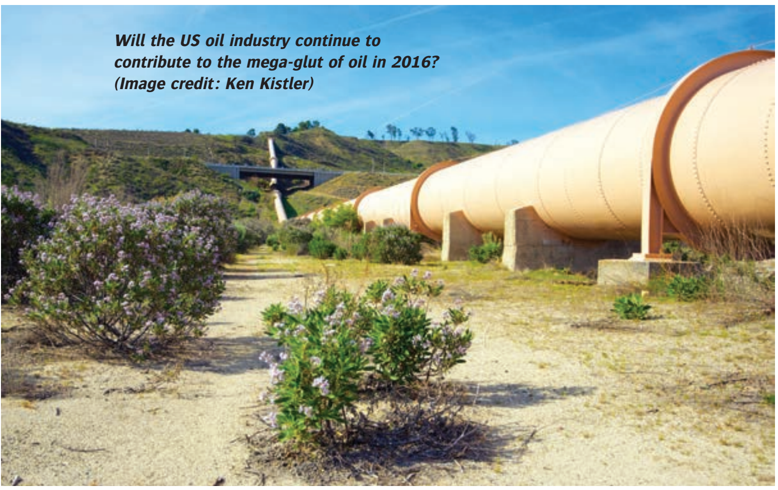
Supply-capacity growth is poised to decline over the medium term as energy giants have shelved planned projects worth $200-250bn. According to Wood Mackenzie, 20bn barrels of oil resources (representing nearly total proven reserves of China) were cancelled last year. It noted: "What began in late 2014 as a haircut to discretionary spending on exploration and pre-development projects has become a full surgical operation to cut out all non-essential operational and capital expenditure."

Rystad Energy reported infill drilling in 2015 fell by two-thirds in three major offshore basins of the Gulf of Mexico, Southeast Asia and Brazil.

What does the future hold?

Looking ahead, the IEA believes the oil market is entering a new era, with markedly changing demand dynamics – as global economy, reshaped by ICT innovation, becomes less fossil fuel-intensive – coupled with significantly different roles for OPEC and non-OPEC producers in regulating upstream supply. Shale is still at a fledgling stage of the E&P cycle, hence its learning scope is substantial and with declining costs of unconventional production technologies, shale producers could emerge as prominent players.

Low-cost OPEC producers need to expand capacity since most are producing at near peak capacity, excluding Saudi Arabia and Iran. EIA expects OPEC surplus production capacity to average 2mn bpd this year, which is largely held by Saudi Aramco. Output growth in Iraq and Iran faces major challenges: the risk of instability, alongside weaknesses in infrastructure and institutions affects Iraq, while Iran needs foreign investment and access to



Will the US oil industry continue to contribute to the mega-glut of oil in 2016? (Image credit: Ken Kistler)

The oil market is entering a new era with markedly changed demand dynamics and a global economy that is less fossil fuel-intensive.

sophisticated technologies of super-majors for reviving an outdated petroleum industry.

Since neither OPEC nor western multinationals have invested sufficiently in new capacity, stagnation is indicated in world output in 2016-18. An unforeseen production disruption would be felt because current global spare capacity (2mn bpd) is vastly lower than 15mn bpd during the mid-1980s. Oil stocks in such scenario will quickly deplete, hence boosting oil prices.

The market rebalancing will likely occur in near future, but will be relatively limited in scope, with prices stabilising at levels higher than current lows but significantly below the highs of the last three years. While US$80-90 a barrel is improbable, prices need to rise to a level that induces more upstream investments – vital for the stability of the global economy.

Moody Investors Service is bullish on oil recovering in the long-term to US$70/barrel. Meanwhile, the consultants PWC estimate oil price settling at about US$50 for five years.

Dr Emmanuel Ibe Kachikwu, minister of state for petroleum resources of Nigeria and president of the OPEC's December 2015 Conference, said: "A balanced and stable international oil market will be of crucial importance in the years ahead to ensure continued investment in the industry as it gears up to meet the world's burgeoning energy needs. This industry is one that lives in cycles. It has seen hard days on many occasions in the past and each time it has shown great resilience." ■

The South African oil and gas industry is at a crossroads with potential for massive investment and development, but progress may be slowed as operators are forced to adjust to the low oil price climate. Nicholas Newman presents an overview of the country's hydrocarbon prospects for 2016 and beyond.

The road ahead for South African oil and gas

ACCORDING TO THE South African Council for Geoscience, the country has proven crude oil reserves of just 15 million barrels located in two places: the offshore Bredasdorp Basin in the south and off the west coast near the maritime border with Namibia, while domestic natural gas output from maturing offshore fields is only around 41 bcf a year. But there is now a real prospect of change for South Africa's oil, gas and refining sectors over the coming years.

This floating production and storage platform was moored in Mossel Bay, on South Africa's Southern Cape, in June 2015 after production was halted at the Oribi and Oryx oilfields after oil prices started to fall. (Tim Abbott/Flickr)

Oil and synthetic fuels

Oil provides 22 per cent of the country's total energy needs, reports Statistic South Africa. According to EIA estimates, South Africa consumed 655,000 bpd in 2014 of which imports accounted for nearly 65 per cent or 425,000 bpd The gap between consumption and imports was filled largely by domestic production of synthetic fuels supplemented by circa 5,000 barrels a day of crude and lease condensate from the mature and declining Oribi and Oryz fields.

South Africa is the world's largest producer of synthetic fuel. Sasol and PetroSA turn local coal and gas into fuel, while Sasol's Secunda synthetic fuel plant, the largest coal liquefaction plant in the world, produces petroleum-like synthetic crude oil from coal.

Refinery Issues

According to the *Oil and Gas Journal*'s January 2015 estimates, South Africa has the second-largest crude oil distillation capacity in Africa, at around 508,000 bpd. According to the South African Oil and Gas Alliance, this is turned into approximately 11.2 bn litres of petrol and 11.9 bn litres of diesel. Domestic refining of crude oil and conversion of synthetic fuels into feedstock, aviation fuel, petrol and diesel, supplement imports of refined products for transport, manufacturing, mining and power.

To put this into perspective, total petroleum fuel sales for South Africa amount to less than sales in Los Angeles. With a lack of investment owing to government price controls, "petroleum companies are unable, through normal market mechanisms, to recoup the investments needed to upgrade refineries to produce cleaner fuels," explains Chevron South Africa chairwoman, Nobuzwe Mbuyisa. Furthermore, the quality of this fuel is often unsuitable for modern, advanced automotive engines.

Efforts to raise domestic quality to Euro 5 emission standards have been delayed by costs, estimated at US$3.7 bn, as well as disagreements between refiners and government over who should pay for these improvements.

Avhapfani Tshifularo, executive director of Sapia, suggests that recovering the upgrade costs would probably require a 20¢ fuel levy on every litre of petrol and diesel for 10 years – assuming that the US$3.7 bn figure is correct.

Refinery operators are currently negotiating with the Energy Ministry for financial incentives to support modernisation and upgrading of their facilities in advance of government regulations, due in 2017, requiring adoption of the much higher emission standards of North America and Europe.

Proposed Coega refinery: a pipedream?

PetroSA plans to construct a US$11 bn 300,000 bpd refinery at Coega, near Port Elizabeth in the Eastern Cape to make good a projected shortfall in supply of refined diesel and gasoline and to meet upcoming new fuel emission standards. However, industry insiders say the business case for Coega is very weak, compared with Durban-based refineries, which have multi-fuel pipelines already connected to the country's industrial heartland. Coega's proposed location has neither a single buoy mooring for unloading crude cargoes, nor a pipeline to deliver its products to markets such as Johannesburg, Durban and Cape Town. These would have to be built to make the project viable.

An alternative solution, suggested by industry insider Keith Bryer of Kranz Bryer & Associates, would be to expand and modernise the existing Sapref refinery to supply 60 per cent or more of South Africa's needs. The enlarged refinery could form the hub of a petrochemical complex able to compete with the Saudi and Indian refineries.

Crude oil imports and exploration

In 2014, South Africa imported 425,000 bpd of crude oil of which, 80 per cent entered through the port of Durban, from where it was transported by TRANSNET-owned pipeline to Heidelberg, in Gauteng province, near Johannesburg. OPEC countries, namely Saudi Arabia (38 per cent), Nigeria (31 per cent), and Angola (12 per cent) were the chief sources of South Africa's crude imports in 2014 although until the 2011 US-led sanctions, Iran was a major supplier.

"South Africa is a relatively undeveloped oil region", says Lizel Oberholzer, director, corporate mergers and acquisitions, Norton Rose Fulbright South Africa. While small fields in the Bredasdorp Basin (oil and gas), the Pletmos Basin (oil and

The quality of petrol for passenger cars in South Africa can be of poor quality. Effotts to improve fuel so it meets Euro 5 emissions standards have been delayed by the cost of these upgrades as well as a disagreement between the government and refiners over who will pay for the project. (ser_is_snarkish, Flickr)

gas) and the Orange Basin were discovered in the 1990s and brought into production, no significant discoveries followed.

However, "technological advances and recent interest in more challenging prospects has resulted in considerable interest in South Africa's petroleum resources, both on and offshore by some of the world's largest oil companies" says Oberholzer.

Paul Eardley-Taylor, head of oil & gas East Africa, Standard Bank, notes that since 2012, "in respect of each of offshore and onshore (primarily shale) blocs, leading industry participants such as ExxonMobil, Eni, Anadarko, Shell, Statoil, Total, Chevron (among others) are now involved in pre-drilling exploration. Current estimates of yet-to-find resources are for multi-tcf of gas and billions of barrels of oil and, it must be stressed that this potential is entirely untested at this point and is speculative".

Natural gas prospects

In 2004, it marked the start of South African imports of natural gas by pipeline from Mozambique, primarily to supply domestic energy giant Sasol's Secunda CTL plant, and to provide fuel for gas-fired power plants in the vicinity of Johannesburg. To satisfy domestic demand, South Africa imports 132 bcf of gas annually from southern Mozambique's Pande and Temane fields by a pipeline with a peak capacity of 524 mcf a day.

Imported gas meets just three per cent of South Africa's current total installed power output of 45,645 MW but, with prospect of successful implementation of the country's gas-to-power programme, its contribution is expected to double to six per cent by 2030. Most of South Africa's current natural gas is produced from the maturing offshore F-A field and South Coast Complex fields and sent to the GTL (Gas to Liquids) facility in Mossel Bay in the Eastern Cap, via an offshore pipeline. Apart from a temporary burst in 2006, domestic offshore gas production has been on a downward trend, plateauing in recent years at little more than 41 bcf.

Although today, South Africa has very limited proven natural gas reserves, its potential offshore natural gas and onshore shale gas resources are thought to be significant. Already licensed for development is the 540 bcf of gas Ibhubesi gas field off the west coast notes Eardley-Taylor. Production is expected to begin operations in late 2017, with an initial expected flow rate of 100 mcf of gas per day destined initially for Eskom's 1,300 MW Ankerlig power station in Atlantis near Saldanha and, eventually, the 800 MW Independent Power Plant, located at the nearby Saldanha Steel Plant in order to aid grid stability in the Cape region.

There is much excitement in South Africa about future gas prospects as set out in the current Gas Utilisation Master Plan. Gas is expected to play an increasingly important role in power generation under the 3126 MW of baseload gas-to-power programme designed to reduce dependence on dirty, if cheap coal, and to diversify South Africa's energy mix. There are four gas prospects under consideration. These are:

- South Africa's technically recoverable shale gas reserves have been estimated by the EIA at 390 tcf ranking South Africa eighth in the world for the size of its resources. Much of this gas is located in the Karoo Desert region, ideal for potential gas power stations with direct power grid access to the country's major cities. However, there is vociferous local opposition to shale gas fracking, which depends on copious supplies of water and the potential damage to this pristine landscape.
- Major energy companies, including Shell and Anadarko, are exploring for gas off the southern coast in the Bredasdorp, Pletmos, Gamtoos, Algoa and Southern Qutenniqua sub-basins as well as along the East Coast's Durban and Zululand basins. The Petroleum Agency of South Africa itself estimates recoverable offshore gas to be in the region of 30 tcf. In October 2015, Shell was given the go- ahead to start drilling in South Africa's Orange basin, reported *Fin24* last October.
- Importing additional gas for the gas-to-power programme. In the short term this would require importing LNG from world markets for delivery to LNG re-gasifiers to be situated at a major port such as Saldanha Bay near Cape Town, or East London and Richard Bay for onward distribution to local power plants and industry. In the medium term, around 2023-2025, Mozambique could become the LNG supplier of choice. For its planned 3.1 GW gas-fired Independent Power Producer plant an integrated LNG-to-power solution is being considered as the cheapest and fastest route to boosting gas-powered generation.
- Also under consideration is construction of a 2,600km north-south gas pipeline connecting Johannesburg with north Mozambique's gas fields. At an estimated cost of US$6 bn plus and a possible construction start date of 2017 or 2018, this would be a long-term option. To achieve sufficient capacity utilisation and justify this scale of investment, South Africa would need to develop a substantial off-take market and build a gas pipeline network linking major industrial centres and cities.

Conclusions

Exploration was postponed, initially due to the industry's unfavourable reception of the Mineral & Petroleum Resources Development Act and delays in its revision. Legislative obstacles aside, Oberholzer observes that "South Africa currently has in place some very good statutory tools such as fiscal and royalty stability agreements that are designed to provide the degree of legal certainty required for high-risk exploration investments". Moreover, "compared to many emerging markets, if resources are discovered, it should be okay. There will be lead time of five to 10 years before production starts which leaves ample time to develop value chains and individual locations."

In addition, "local companies will become increasingly involved as will domestic investors and service companies, " predicts Eardley-Taylor. Despite the slump in oil prices, South Africa could be on the brink of take-off in exploration for its oil and gas resources. ■

Power outages, under-developed resources and the low oil prices are presenting challenges for the South African hydrocarbons sector but there are opportunities, especially for independent operators, as Phillip Steyn writes.

Energy drives prosperity

South African exploration

TODAY, SOUTH AFRICA finds itself at a crossroads. Facing country-wide power outages while sitting atop some of the world's largest untapped oil and gas reserves, its economy, people and environment are stuck at an impasse.

Challenges for South Africa

In 2015, there were nearly 100 days of scheduled power reductions in the country. While the people of South Africa are beginning to learn to deal with the unfortunate reality of regularly living without electricity, and grappling with the environmental implications of more than 85 per cent of state-owned Eskom Holdings' generation capacity coming from coal-fired power plants, the unfortunate result is the highest per capita greenhouse gas emissions in Africa.

Additionally, with less than one per cent of power supplied by true renewables, primarily from hydropower, the issue is continuing to dramatically damage the nation's already sluggish economic progress.

However, the oil price plunge of 2014 and ongoing depressed commodity market represent a unique opportunity for independent energy companies like Rhino.

The industry response has been far-reaching, with majors and supermajors implementing draconian cost-cutting measures across the board. With capital budgets slashed, most E&P companies are reducing their spend in Africa and other frontier areas.

But the need to develop these resources remains as critical as ever. Enter the independents, whose small size and nimble footing allow them to pivot, re-strategise and lay the groundwork for inevitable pricing uptick.

The role of technology

Technology, in particular leveraging the latest advances, will continute to be important for the independent players seeking to take advantage of myriad opportunities in South Africa, despite the low oil price environment. Rhino's technology focus is an advantage that will allow us to explore and develop Africa's oil and gas resources not just safely, but also cost-effectively.

To acheive success, it is important to utilise an array of advanced technologies to find oil and gas, such as advanced satellite imagery and mapping, controlled source electromagnetic surveys, gravity gradiometry surveys, magnetic surveys and new advanced full tensor gravity mapping. Rhino has made significant investments in a wide array of software and hardware to process and interpret both 2D seismic as well as state-of-the-art 3D seismic data, including quantitative seismic interpretation for direct hydrocarbon indicator identification via the use of a super computer.

By using advanced technology, Rhino is able to eliminate non-productive areas and focus on productive oil and gas producing areas, which increases the company's success and reduces our environmental footprint.

South Africa is challenged by regular power outages and reductions but development of untapped oil and gas resources could help overcome this problem.

The need to develop oil and gas resources in South Africa remains as critical as ever.

Rhino's exploration plans

Rhino Oil and Gas Exploration, is currently seeking approval to begin the initial stages of a non-invasive, 3-year evaluation process which will determine where there are domestic oil and gas resources available that might one day be able to be safely developed in order to benefit the people and economy of South Africa.

It is technology-driven, independent oil and gas exploration and development company focused on Africa. Based in Texas, it works with a number of partners on the ground in South Africa. It currently hold the permits and are applying for rights to two offshore areas, totaling more than 28,000 square kilometres, as well as five onshore areas, totaling nearly 74,000 square kilometres, within the country.

Rhino is also actively pursuing concessions across other parts of the continent where there are under-explored plays in basins that have proved and productive oil and gas assets. The company significantly expanded its African footprint recently with the acquisition of two offshore blocks in the Comoros territorial waters off Mozambique in East Africa and the signing of Production Sharing Agreements in the AGC Senegal/Guinea-Bissau Cooperation Zone in West Africa. In addition to these positions, Rhino holds two offshore blocks in Namibia, one of them bordering the Kudu Field. ■

Phillip Steyn is a founder of Rhino Resources in Africa, and he is now vice president and chief operating officer of Rhino Oil and Gas Exploration. He is responsible for the company's strategic land acquisition and high level negotiations as well as its day-to-day operations.

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Event report

Speakers at International Petroleum Week offered a cautious blend of optimism in regard to investment opportunities and improving local content on African oil and gas projects, tempered by calls for improved regulations and governance. Georgia Lewis reports.

Opportunities in a low oil price environment for investors in Africa

WHILE LOW OIL prices are casting a long shadow over oil industry discussions, there was still room for optimism at "The African Oil and Gas Growth Story" conference, a parallel event at International Petroleum (IP) Week.

Ade Adeola, managing director, regional head of oil and gas, Africa and Middle East, Standard Chartered Bank, chaired the conference. He said Africa can benefit from its combination of large international energy companies, "vibrant, younger companies" and a "robust mid range of companies" that are all present in the market.

"Even if oil prices fall to US$25, there is a good balance of gas production capacity [and the African energy sector] continues to be resilient, there remains a lot of significant opportunities," said Mr Adeola.

The need for increased production capacity; addressing the energy deficit across Africa; and the issue of increasing local content so that local economies genuinely benefit, were addressed by the speakers. Dr Alastair Milne, vice president exploration, sub-Saharan Africa, for Shell, called for stable fiscal regimes and transparent, effective governance to support capacity building.

Timi Familusi, strategy leader for Accenture in sub-Saharan Africa, pointed out that Africa is not "one homogenous entity" and outlined the different activities in different countries. These include "tier one" countries, such as Nigeria, which are long-term producers, "tier two" new, small-scale producers with potential to grow, such as Ghana, and "tier three", the "emerging frontier" countries, such as Niger, Senegal, Liberia and Cote d'Ivoire. He said that tier three countries have to make the decision to invest now or later, while tier two countries should look to becoming tier one countries by producing more oil and gas.

Financing the future

"Brian Marcus, director, oil and gas industries, Africa and MENA, for Standard Chartered Bank, offered insights into how oil and gas operators can obtain finance for African projects. He said the bulk of loans are currently going to west African operators, with the most successful deals being "straightforward with a low risk to lenders", and "highly liquid independents", independents with large gas reserves, large independents, and independents with conservative balance sheets are being favoured by lenders.

As well as oil price volatility, other obstacles cited by Mr Marcus included merger and acquisition consolidation, a refocus on midstream and downstream projects, and difficulties for small companies in obtaining finance. "The focus is on not going outside the norm," he said.

Ade Adeola with the panel for the morning session of the African conference at IP Week.

Mr Marcus told the conference that banks are flexible enough to not exacerbate challenges faced by operators and "pragmatic solutions" from borrowers are welcome. He added that NOCs have large funding requirements and that hedging may be required to support debt capacity and protect lenders. However, NOCs can be more creative financially than independents because of their need to continue development.

Theophilus Ahwireng, CEO, Ghana Petroleum Commission, spoke about the ongoing investment opportunities in Ghana at multiple locations, offshore and in the largely unexplored but sizeable Voltaian Basin. Mr Ahwireng said the focus was on promotion and exploration, with more work needed to "keep the value chain moving" and expand ports. He is hopeful the new E&P bill will "give more clarity" to investors.

Paul Mayland, chief operating officer for Cairn Energy, spoke about deepwater opportunities in Senegal, one of the emerging markets in Africa. First production is anticipated for 2021-2023, Mr Mayland told the conference.

Workforce challenges

Sonja Palm, programme director of employment, development and skills for oil and gas in Africa, for GIZ, said that job creation is needed for sustainable economies. She urged that oil and gas development should benefit local economies and create jobs in other sectors, such as catering, waste management and housing.

Palm said it is important for skills to match the needs of operators, and for a greater understanding of the industry. She pointed out that in low-income countries with a small formal economy, there are "high expectations with the development of oil and gas reserves", particularly in areas that rely on agriculture. Palm's solutions included using oil and gas as a driver for growth, developing transferable skills, and coordinating local skills with the needs of ooperators.

Dr Amy Jadesimi, managing director for Nigeria-based LADOL, spoke about "real local content" in her presentation on private sector-driven investment. She urged more investment in African oil and gas activities before governments update regulations because once private sector investment is there, this can drive governments to put legislation in place.

Local content strategies that have "a multiplier effect of real economic growth" are important, said Dr Jadesimi. LADOL has created a free zone, developed greenfield land, and an FPSO project to keep activities in Nigeria.

"It is not real local content if it does not lead to job creation," she said, pointing out that such strategies "lower costs and create linkages with other sectors, and create a middle class". ■

In the wake of low oil prices, global merger and acquisitions activity collapsed. But are there signs of hope for deals in sub-Saharan Africa? Energy industry investment banker, Kurt J. Davis, shares his insights.

Mergers and acquistions

Potential deals in Africa

GLOBAL M&A activity collapsed in the face of sub-$60 oil, with potential deals stalled by weakened valuations and thwarted investor enthusiasm.

Deal spend in 2015 marked the lowest total in almost 15 years, with deals per month averaging less than 20 per month compared to more than 40 per month in 2014. The 'lighter than expected' 2015 fall borrowing base redeterminations and the industry's quick (and aggressive) response to plummeting prices effectively warded off the pressure for 'forced' sales, excluding some lower tier non-core assets sold by a small portion of the market.

But the impending spring borrowing base redeterminations – to be calculated with adjusted price decks (i.e., $45-$55 range for major banks compared to the $65-$75 range used in fall determinations) – and sub-$40 (currently sub-$35) spells immediate trouble for some companies.

All indications point to an uptick in asset sales, particularly of higher quality compared to 2015, as companies look to address balance sheet concerns.

This uptick assumes no unforeseen price rebound in the near term. Financing options will be limited, unlikely to provide the debt and equity liquidity available at the beginning of 2015. The top tier international oil companies can likely endure another year of low prices. Yet the greater amount of companies at a tier below cannot.

Adjustments in demand and production will not help the situation.

The growth in global demand has slowed, especially as China – 12% of the worldwide oil consumption – struggles to sustain its previous years' economic growth rate. And production remains high as OPEC cannot agree to production cuts to boost prices. OPEC (particularly Iraq and Saudi Arabia) and Russia are currently producing at decade-high levels.

What does all this mean for sub-Saharan Africa?

A bump in global M&A in oil signals hope to a battered region. Some analysts estimate a potential deal pipeline north of 300 deals and $300 billion for the global oil & gas market.

Yet those numbers beg a few questions: (1) Are there really many deals available in sub-Saharan Africa? (2) What is the pricing on these potential deals? and (3) What buyers are in the market to purchase assets in sub-Saharan Africa?

Potential deal flow

Potential deal flow, primarily conventional oil, in the region sits around 30, with the biggest opportunities available in Ghana and Nigeria in West Africa, Angola and Mozambique in Southern Africa, and Kenya and Tanzania in East Africa.

This estimate not surprisingly amounts to a feeble 30% of North America's potential deal flow. But it does compare well to Asia (around 50), Europe (around 40), and Latin America (around 20).

Although the assets are potentially there for sale, an upturn in actual deal flow will rest on the oil price upon which operators make decisions. Valuations on sub-Saharan assets held up well during 2015, particularly early 2015, when asset holders bet on price recovery and priced in a long-term oil price/bbl of US$60 to US$70.

> "Are there really many deals available in sub-Saharan Africa? What is the pricing on these deals and who are the potential buyers?"

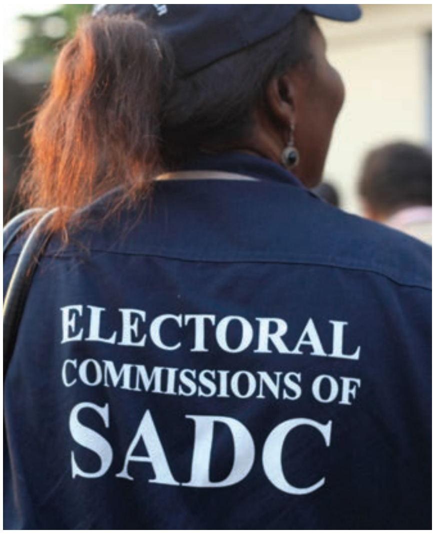
Pricing deals in today's market

The new price market will not support similar optimism in valuations. Anadarko and Eni hold attractive assets in Area 1 and Area 4 in Mozambique. But already having spent significant capital expenditure, are they serious about farming down or completely exiting, and at what cost? Similar questions have to be raised about Tullow TEN project in Ghana, expected online in 2016, and the Tullow /Africa Oil project partnership in Kenya. Maersk Oil, Ophir and Total also hold attractive assets in Angola, Tanzania and Nigeria respectively.

Who are the buyers? Core or non-core?

Some companies remain bullish on sub-Saharan Africa. Many others have repositioned the focus outside of the region or targeted the 'sure' bets as part of a greater strategy to focus on their core. Assets in Angola, Gabon and Nigeria are generally in the core category with international oil companies comfortable with the maturity of the assets and relatively lower capital requirements.

More immature assets in West Africa's Ghana and East Africa (Mozambique, Tanzania and



Will upcoming elections in the Democratic Republic of Congo play a role in M&A activity? (Image credit: Flickr/MONUSCO Photo)

Uganda) are core to those willing to spend capital and still bet on the long term. These sales, if Anadarko's recent decision to wait before deciding on its Mozambique position is any indication, will come around mid-2016 or later.

Emerging countries with mature assets, but still relatively higher capital spending requirements, will likely see local assets on the market first in 2016. That list includes West African countries – Chad, Equatorial Guinea, and the Democratic Republic of Congo – all three which ironically have an election upcoming in 2016 which could play an additional role.

The questions of capital appetite

After answering the 'core versus non-core' question, the international oil companies will have to answer the question of capital appetite. The belly (or balance sheet) has to be big for those companies to be open to buying assets in a US$40 environment.

A few players, including Shell with its purchase of BG, made noise in 2015 with US$60 oil on the horizon. But US$40 is not US$60.

Beyond the international oil companies

The major international oil companies will likely be net sellers with large cap oil companies waiting for opportunistic acquisitions.

Mid-cap oil companies are less likely buyers in this region as they are typically managing

Like Nigeria and Saudi Arabia, Russian oil producers are showing no signs of slowing production, despite warnings about the impact this could have on the market and on M&A activity.
(Image credit: Flickr/World Bank Photo Collection)

"PE firms hold the potential purse strings in the oil industry's liquidity as well as the industry's billions of debt liabilities from the price drop"

more restricted balance sheets and are focused on organic growth.

The Asian National Oil Companies (ANOCs): The ANOCs responded similarly to their American counterparts by cutting capital budgets in the lower price market. Expect more of the same as the price remains below $40. But do not sell the ANOCs short on being opportunistic in this market. Balance sheets are strong and ANOCs have an interest in increasing their Africa participation to match IOC peers. It is merely a question of when the ANOCs open their purses.

Private Equity (PE): Private equity companies are holding buckets of cash to spend in 2016. PE pocket books swelled with the price slump, with investors pouring cash in to make counter-cyclical investments in oil.

All that said, PE firms will not make hasty decisions. The firms hold both the potential purse strings to the sector's liquidity as well as the sector's billions of debt liabilities from the price drop. And cautionary stories of KKR with Samson Resources (now in bankruptcy) or Apollo with Energy & Exploration Partners (now in bankruptcy) will ensure slow, cautious movement. Not too sure if sub-Saharan Africa is on the radar.

Indigenous Players: This once active and growing group has remained relatively quiet. A relatively small portion of the indigenous players were top-tier operators.

Thus, as high prices enticed operators with less operating experience because prices covered for mistakes, low prices have discouraged local players across the region. Yet history teaches us never to count out the indigenous players if there is any price recovery. ■

Kurt Davis Jr. is an investment banker focusing on the natural resources and energy sectors, with private equity experience in emerging economies. He earned a law degree in tax and commercial law at the University of Virginia's School of Law and a masters of business administration in finance, entrepreneurship and operations from the University of Chicago. He can be reached at kurt.davis.jr@gmail.com.

Past oil and gas mergers and acquisitions in Africa

WHEN OIL PRICES were higher, there was significant M&A activity in the African oil and gas marketplace. 2010 was a busy year for such transactions, when the average oil price for the year was $71.21 a barrel. The biggest asset sale in African oil and gas for 2010 was Tullow Oil's acquisition of Heritage's 50 per cent stakes in Ugandan Blocks 1 and 3A. This deal was worth a total of $1.45bn. That year saw BP's $7bn worth of sales of assets to Apache Corp across three regions. The African component of the sales, while the smallest, was worth $650mn for four development leases and one exploration concession across 394,300 acres in Egypt. Shell, Total and ENI collectively sold their equity in four Nigerian leases for just shy of $500mn.

Thomson Reuters tracked 236 M&A transactions in Africa between September 2011 and March 2012 and found that energy, mining and utilities sectors recorded the highest level of activity. The largest M&A deal in Africa in that timeframe took place in the first quarter of 2012. This was the acquisition of mining and exploration interests in the Democratic Republic of Congo by the Eurasian Natural Resources Group, and this deal was worth $1.25bn.

Between 2011 and 2013, average oil prices were healthy, averaging $87.04 in 2011, dipping to $86.46 in 2012, and topping out at $91.17 in 2013. In 2014, the average price dropped to $85.60. The big crash came at the end of 2014 with the average price in November 2014 at $68.62, dropping to $47.25 the following month.

Ernst and Young kept track of oil and gas M&A activity, reporting an increase in Africa's transaction volume from 93 in 2011 to 97 in 2012. While this only represented a moderate increase, the transaction values grew considerably with $11.7bn worth of deals in 2012, up from $7.7bn in 2011. Sinopec acquired Total's 20 per cent stake in Nigerian deepwater block OML 138 for $2.5bn, which boosted the average deal value. Ernst and Young was upbeat about greater deal flow for 2013, but the outlook was adjusted for 2014 and beyond.

When oil prices started to drop in 2014, deal volumes and values fell, particularly in comparison to the M&A bonanza of 2013, which saw 146 deals with a combined value of $22.2bn. In contrast, there were only 95 deals in 2014, with a reported value of $8.7bn.

2014 was a slow year for M&A activity. The largest deals for 2014 were relatively modest: the Marathon Oil Acquisition of a 50 per cent working interest in Ethiopia Rift basin area from Africa Oil Corp for $18mn, FAR and Pancontinental's farm-out in Kenya's Block L6 to Milio International for $10.5mn, and Ophir Energy's acquisition of a 75 per cent working interest in an offshore block in the Seychelles for $8.3mn from WHL Energy Limited.

Ernst and Young reported more "robust" activity in West Africa for 2014, particularly with Nigerian deals such as onshore divestments by IOCs, corporate M&A activity and partnerships with local companies. Angola, Cameroon, Cote d'Ivoire, Gabon, Senegal, Ghana, Guinea and Liberia also reported transactions, particularly with exploration licences.

Namibia dominated 2014 deal activity in southern Africa, while Zimbabwe, Botswana and South Africa only saw one deal each in unconventionals. The only corporate M&A was Tower Resources acquiring Rift Petroleum for $43mn. Other deals with unreported values were OMV and Murphy Petroleum acquiring two Namibian block interests, ENI acquiring an exploration block from Sasol in South Africa and Tullow's farm-in to a Namibian block.

Ernst and Young accurately anticipated 2015 deal activity expected to remain low, with exploration activity being delayed owing to falling oil prices.

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Hytera Respond & Achieve

Even in the current low oil price environment, proper investment in safety and security management is essential. Andy Gibbins, director of GLAS Consulting, explains how oil and gas operators can improve.

The importance of investing in safety and security

THE OIL PRICE is low. Competition for market share is fierce. Margins are squeezed. All of this means that business continuity is absolutely essential – extended outages could be crippling.

I once asked a group of delegates why their safety performance was so good. One of the more vocal delegates replied: 'Because God is a Nigerian'. Everyone had a very good laugh, but we did go on to discuss the gaps that existed in safety and security systems and that we couldn't rely on good luck or divine intervention to maintain the very highest levels of performance.

Regarding security, given all that is happening globally and across Africa, it is vital to ensure operations are resilient enough to withstand a serious incident and that plans are in place to effectively manage the disruptions. Successful organisational resilience stems from a well-developed, regularly tetsed strategy embedded throughout the whole organisation.

This means understanding business continuity and how to manage the practicalities. It means developing strategies for organisational resilience that involve the entire organisation. It means testing organisational resilience to ensure fitness-for-purpose and understanding how to withstand the impact of a serious incident.

The starting point is a business continuity policy, together with a business continuity management system. This requires a team of people with the right blend of skills and experience, along with investment in high quality training and consultancy support. With the team in place, it is then possible to assess the likely threats and how they should be dealt with. This will allow the relevant procedures to be developed. With the procedures developed, training can be carried out to ensure that the entire organisation is ready to deal with threats.

If the worst should happen, it is important to ensure that plans are in place to deal with all of the consequences that can arise. Again, this means having the right skills, well-defined procedures and regular testing. The worst time for first time dealings with the media is when they are camped at the site gate following an incident.

We have seen enough incidents in Africa to know that such incidents can happen and the consequences can be devastating to any organisation. Sadly, we can say with some certainty, that such incidents will happen again.

Good organisations should focus relentlessly on personal and process safety. From a business continuity perspective, this is paramount.

Lessons can be learned for the entire industry from the Deepwater Horizon incident. Image credit: Flickr/Deepwater Horizon Report

The oil, gas and petrochemicals industry has seen too many high profile incidents such as Bhopal, Deepwater Horizon, Texas City and Piper Alpha. These incidents cost lives, have a huge financial impact, and they harm company reputations. Although much information has been shared about these incidents, as we see in the news, process safety incidents just keep happening and catastrophic ones at that.

Process safety management (PSM) is about prevention. It means the highest design and operating standards. EPC contractors should know how to design plants safely and jointly with the operating company, should carry out Process Hazard Analysis at various stages, including a comprehensive HAZOP study during design. Layers of protection are incorporated into the design, to make the facility as safe as is practicable. The design should be robust and not reliant on human intervention to operate safely. This means high integrity design with incorporated safety instrumented systems, which return the plant to safety after an incident. Techniques such as LOPA (layers of protection analysis) can be used to make a quantitative assessment of the probability of incidents.

When it comes to operating plants, the advice I always give is to avoid complacency at all costs and at all levels. Getting the operational basics right is so very important but so often fails to happen. Operational discipline means doing the right things, the right way, every time. It means high quality training, attention to detail in logged data, effective shift handover, alarm management, management of contractors and start-up planning.

PSM requires the right organisational structure. Firstly, organisations should have someone at board level with clearly defined accountability for PSM. There should be clear measures and targets to track performance. There should be PSM experts with sufficient influence to drive positive change. Finally, all line managers should receive training in PSM, as well as having clearly defined expectations for their role.

Strong leadership is essential. Leaders should ensure that all requirements for PSM are identified, implemented and managed via a strong system. Leaders must ensure rigorous compliance with the systems and standards, and problems identified and dealt with quickly.

For organisations new to PSM, a good starting point is to carry out a PSM performance audit. Staff need good awareness of what they must do in their roles to keep the plant safe.

PSM is not rocket science. It needs leadership, strong organisational support, good procedures and rigorous implementation. It requires organisations not to be complacent. Divine intervention is not enough! ■

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Repairs to assets, such as pipelines, vessels in pressurised services, flanges and valves, can be more effective if two-part composite repairs are undertaken. Osmay Oharriz, from Belzona Polymerics, explains the latest techniques.

Compliant composite solutions

A durable alternative

TWO-PART COMPONENT composite repairs have gained greater acceptance, not only because these repairs provide an engineered, durable, and affordable alternative to replacement, but also because they comply with international engineering standards. These repairs typically comprise a resin material and a reinforcement sheet that can be tailored for applications onto pipeline, pipework, vessels in pressurised services as well as bends, flanges, valves, and reducers.

As the composite repair must form a bond with the damaged substrate, it relies on the adhesive quality of the resin for some of its strength. Epoxy-based resins can be used as the base material for two-component composite repairs due to their excellent adhesion, mechanical properties and erosion-corrosion resistance. The reinforcement sheet provides strength to the repair and hoop strength.

Components of composite repair

Good communication between the end user and the designer is paramount. Data to be supplied by the end user include:

- Original equipment design and operating variables, also including mechanical loads and detailed description of the defective area.
- Maintenance and operational history.
- Service condition data including expected repair lifetime and future service conditions.

Once the type of defect, metal loss or through-wall, and geometry of the repair are confirmed, the designer will calculate the thickness of the composite repair, axial extent of the repair, and the number of required wraps. The repair parameters should be shared with the end user. The installer will possess proper validation issued by the composite repair manufacturer.

The materials to be used will be provided in their right amounts and reinforcement sheet will be free of contaminants or damage.

Application should commence as soon as the surface is prepared. In the event that the substrate is suffering from metal loss, the original thickness of the substrate can be rebuilt by using compatible epoxy paste-grade materials.

Embracing new techniques for maintenance can save time and money and achieve better results.

The resin will be stippled onto the substrate profile to minimise the risk of air entrapment and achieve an optimum bond with the substrate. The sheet should then be wetted with the same resin.

The reinforcement sheet should be wrapped over the first layer of resin, maintaining a pre-fixed degree of overlapping throughout. To achieve contact between layers, exert firm hand pressure. The angle at which the reinforcement sheet is laid should be alternated to make the fibres multidirectional, for a strong repair.

The same procedure should be repeated until the required number of wraps has been achieved. Repair is consolidated by tightly wrapping a release plastic film. The system must only be returned to service after full cure is achieved.

By using a qualified two-part composite repair system and validated, best-practice installation, supervision and design personnel, equipment can be safely rectified to a "zero-defect" status. ■

Meeting the competing demands of superior safety performance, productivity and local content requirements is realistic and achievable, according to United Safety.

High safety standards and local content success for Congo and Angola

RESPONSIBLE OIL AND gas operators, both onshore and offshore, need to have solutions in place for entire projects, from drilling inception to final well completion.

When implementing a health, safety and environment (HSE) programme across an entire hydrocarbons operation, several factors are important, particularly to African operators.
These include fast deployment, seamless transition, meeting local content demands, and efficient project management.

United Safety has played an integral role in this process across multiple countries, including Congo and Angola. Overall the company has supported 789 turnarounds, has 9,835 people under its protection, and there have been zero fatalities on their watch.

When implementing a HSE programme, several factors are important, including fast deployment, seamless transition and meeting local content demands.

Congo HSE case study

United Safety had the challenge of providing quality HSE supervision services under a stringent timeline for a major IOC in Congo.

The IOC had three different hydrocarbon operations in Congo, namely construction, drilling and production, all of which needed a world class HSE programme implemented in a timely manner. The three projects involved a diverse workforce of contractors, multiple daily activities and simultaneous operations.

Existing safety supervision was insufficient when United Safety took on the project and long recruitment cycles were made even more complicated due to local content requirements. This, in turn, led to core staff members stretching their attention between important responsibilities and safety topics.

The solution was to provide efficient project management, and effective recruitment and training so that high-quality HSE personnel would be mobilised quickly.

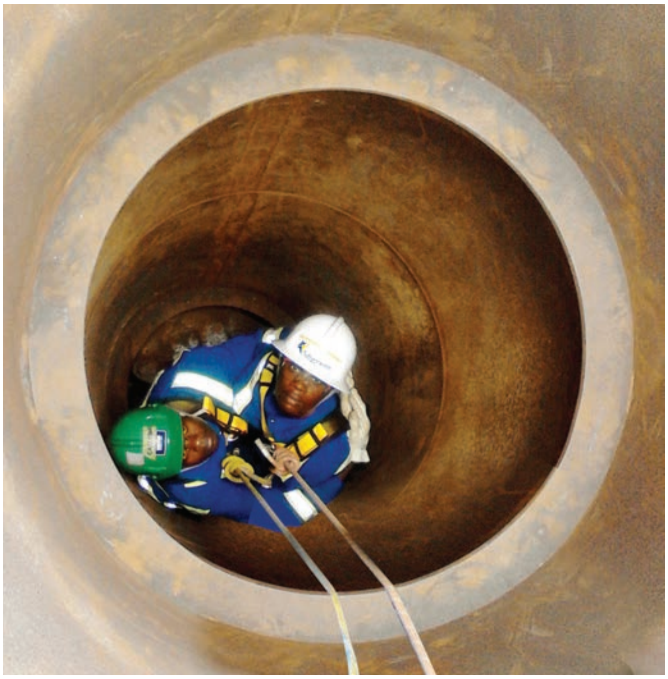
To do this, United Safety applied its proven recruitment and training processes and, as a result of this, were able to mobilise 65 HSE positions in a three-month period, while adhering to stringent local content requirements. A seamless transition from the former safety provider was achieved.

By maintaining strict training quality and focus on best practices for site safety, the client was able to improve its safety performance. Value was added to the project by deploying experienced safety project managers. They were able to help improve coordination of safety resources onsite, streamline communications between management, operations and safety staff, and ensured quality of HSE services.

Additionally, United Safety was able to provide high-quality HSE staff to implement the programme, which allowed other employees to focus on their main responsibilities

Angola local content and safety projects

In Angola, United Safety has been instrumental in providing a skilled Angolan workforce, while using local suppliers, so that clients can meet their



Training employees to work safely in confined spaces is a very important part of HSE training for United Safety's clients in Congo and Angola.

business objectives along with HSE and local content requirements. Providing industrial safety products, safety consulting and training are all services offered by United Safety to meet these demands.

Spending on procurement with local suppliers has had a double-digit growth every year since 2002. Back then, United Safety's only Angolan client was Chevron but today, the Angolan client list is diverse and, as a result, more local people are being trained and are being promoted to leadership positions.

There is a coaching and mentoring programme in place in Angola in which each Angolan operation manager reports to the United Safety advisor responsible for their department. The advisor coaches the Angolan managers to prepare them for full autonomy.

As a result of United Safety's work in Angola, more than 95 per cent of its workforce is composed of Angolans.

In-house training is essential for United Safety to be effective in Angola. In 2013, United Saefty School started to operate and one of the main objectives was to train confined space technicians. As a result of successfully training Angolan professionals, their services are not being requested in the Middle East to provide training and expertise to industrial operations.

United Safety leadership

Nnaemeka Ezeani is United Safety's Vice President for Africa and is based out of Dubai. He has more than 20 years of experience in the Oil and Gas industry around the world. He brings expertise from a range of roles and disciplines including Operations and Project Management, Sales & Business Development, Career Planning and Business Management.

Making the most of aerial survey technology can save oil and gas operators time and money, and improve employee safety. Philip Buchan, commercial director of Cyberhawk Innovations, explains the benefits for operators.

Aerial technology: Eyes in African skies

OIL AND GAS operators around the world own, manage and maintain extensive infrastructure and assets, onshore and offshore. It is essential, and often a legal requirement, to regularly inspect these assets to prevent issues which might affect production and the safety of personnel. Regular inspection is required so potential issues can be monitored and addressed as quickly as possible.

Inspection programmes, however, can be time-consuming and costly and, can mean personnel working in dangerous, difficult-to-access environments. In many cases, inspection technicians are required to work at height, and while techniques such as rope access offer significant safety advantages when compared with scaffolding, risks are still present.

Back in 2008, a team of innovative minds spotted a gap in the oil and gas inspection market for the use of Remotely Operated Aerial Vehicles (ROAV), otherwise known as UAVs or drones. Cyberhawk Innovations completed the world's first onshore and offshore oil and gas inspections and set drone technology on course for exponential growth in the oil and gas industry.

Innovation for the industry

According to a 2015 report from Radiant Insights, the worldwide commercial drone market is set to reach US$4.8 bn by 2021 and, in particular, notes that drones have "fundamentally changed the accuracy of utility and oil and gas inspections". This growth is attributed to more economical visualisation and navigation provided by drone systems, including mapping and inspection from the air.

Specifically for the offshore sector, the ability to conduct multiple work scope inspections on one mobilisation is advantageous. Inspections can include splash zone, risers, elevations, overboard structures, flare and derrick on assets, all while they are online, in a fraction of the time usually taken by a person. No matter the scale of the asset management programme, operators can better plan maintenance and turnarounds. There are huge efficiencies to be gained.

Cyberhawk has shown that where a rope access team could take up to 14 weeks to inspect a complex area, an ROAV inspection has been shown to complete the same project in three days. This means increased facility uptime and reduced deferment, leading to cost savings and maximised production time.

Aerial inspections make accessing hard-to-reach areas much easier, and therefore safer, for employees.

ROAV inspections offer oil and gas operators time and cost savings, as well as huge safety benefits.

A further example of the significant efficiencies to be gained is in terms of costs. A recent offshore flare inspection saved the client around US$2.3 mn, by avoiding the requirement for an abseiling team and a platform shutdown, which would have taken seven days to complete.

In addition to the time and cost savings, ROAV inspections provide huge safety benefits. Working at height is the single largest cause of fatalities in the workplace, but ROAVs reduce this requirement with rope access technicians only being necessary when the aerial inspection has identified that maintenance and repair is required.

Taking flight globally

The UK's *Guardian* newspaper reported in January 2015 on the growing interest of drones in Africa, with usage increasing due to the crossover from the military to consumer-geared unmanned aircrafts. However, the article also identified African drone laws to be among the most stringent in the world, meaning gaining permission for the legal operation of a commercial UAV can be challenging. For many operators, experience will be limited and in the safety-conscious oil and gas industry, significant understanding is required to to convince a local aviation authority to provide permission for commercial operations.

Cyberhawk has completed commercial assignments in Africa, the Middle East, Europe, Asia and North America. Operators trust Cyberhawk's oil and gas experience and skilled staff, who ensure inspections are carried out safely and efficiently. While the uptake of commercial drone use has been slower tin Africa than in Europe, as the oil and gas sector becomes aware of the benefits of ROAV technology, there is no doubt that we'll see more 'eyes in the sky'.

Cyberhawk case study

Cyberhawk was tasked by an oil and gas super-major to conduct the world's first ROAV inspection in West Africa, completing a number of live flare inspections.

The rationale behind using ROAVs was to avoid shutting down platform operations while inspections took place, and reduce the working-at-height dangers.

Cyberhawk's two-man field team, comprising an inspection engineer and a pilot, inspected five live assets for the client in less than a week. Alternative methods of inspection would have taken months to complete and required a complete shutdown of the facility.

Using ROAV technology, which allows for the inspection of flare stacks and tips while they are live, avoided the need for a plant shutdown and saved the client more than $US11 mn.
The detailed inspection reports provided the facility with the information that is required to plan and prepare flare tip replacement and repairs during the next planned turnaround. ■

www.thecyberhawk.com

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The benefits of properly managing data are many. For oil and gas operators, it can have a positive impact on the bottom line, improve productivity and save time. Emmanuel Udeh, a subsurface data analyst for Shell Petroleum Development Company in Nigeria, explains why big data management is essential.

Reliable, accurate and timely:

Big data for oil and gas

FOR ANY LARGE business to remain competitive, it needs the ability to make accurate and timely decisions, and this depends heavily on good quality and reliable data. Everything we do depends on data. Decision quality depends on data quality. We all need to prioritise and improve on data quality.

In the oil and gas industry, the huge safety and environmental implications of taking the wrong decisions, as witnessed in the 2010 BP Oil Spill incident off the Gulf of Mexico, for example, make this even more important.

In addition, the industry is very diverse, with several business units all having various unique strategic needs and requirements.

Downstream uses data to deliver fuel accurately to customers. Finance uses data to pay vendors and reconcile accounts. Data is used to determine oil and contract pricing. HR departments use data to manage staff performance and improve productivity. Upstream operators use data to locate mature hydrocarbon prospects for development.

The Common Data Access (CDA) DM Value Study found that 73 per cent of the value of E&P activity comes from an understanding of the subsurface and 38 per cent of this understanding comes from data. Furthermore, given the volatility of today's economy with the low oil price environment set to last for longer than many in the industry had hoped or expected, most major oil and gas companies seek to optimise and balance their business models in the most cost-effective ways possible. This can be done in multiple ways, such as reducing the levels of investments required in E&P activities for new oil, maximising production through a tailored and fit-for-purpose Wells, Reservoir and Facilities Management (WRFM) plan, or determining if continued improvement and investment in equipment is required to extend plant life. But regardless of how this is done, companies must be aware of the role of effective data management in achieving business objectives.

All these efforts to improve the bottom line and deliver business value can only happen when decisions are based on accurate data.

Accurate data implies high data quality. This is one of many data management challenges faced by the oil and gas industry, as well as many other businesses such as healthcare, utilities and finance.

Data quality can be defined as the state of completeness, consistency, timeliness and accuracy that makes data appropriate for specific purposes in organisations.

According to the 2010 Data Management Body of Knowledge (DAMA-DMBOK Guide), data quality management (DQM) is a critical support process in organisational change management. Data quality is synonymous with information quality, since poor data quality results in inaccurate information and poor performance.

Many organisations approach data quality problems by employing data cleansing methodologies, resulting in short-term and costly improvements that have little effect in the long run, as they do not address the root causes of data defects. For any dataset to be qualified as being of good quality, it must possess some essential characteristics.

Data quality is synonymous with information quality ... poor data quality results in inaccurate information and poor performance.

Shell experts analyse seismic data at the EpiCentre facility, Rijswijk, which is part of the company's operations in the Netherlands. Expert seismic data interpretation is essential for E&P operators globally. (Image credit: Shell)

Accuracy

Data accuracy measures the degree to which data correctly reflects the realities of the conditions modelled. Data needs to be free from errors and it needs to be representative.

The E&P business is highly reliant on accurate data because of the high risks involved. For instance, planning a well using inaccurate formation pore pressure data could result in serious complications, such as formation fracture or borehole instability, which could lead to fatalities and cause significant damage to equipment and the environment while drilling.

Completeness

One approach to completeness is to ensure that certain attributes always have assigned values in a data set. Another approach is to ensure all appropriate rows in a dataset are present. For instance, a complete list is required in a tabular form of all marker top and fluid fill predictions for all zones to be penetrated (or avoided!), This table is expected to include both vertical and lateral uncertainty, clearly highlighting areas of geologic concern such as fault zones, loss zones, and so on.

Consistency

Quality data must be consistent across the board, such that data set values or naming conventions must be uniform wherever such data sets occur. This effectively ensures that data values in one data set are consistent with values in another data set.

The expectation is that similar data values drawn from separate data sets must not conflict with each other. It needs to be in sync across entire enterprises.

Timeliness

This refers to the degree to which information is current with the environment that it models. This measures how fresh the data is, as well as its correctness in the face of possible time-related changes, which is particularly essential in the oil and gas industry.

An example of this is where Integrated Production Simulation Models (IPSM) are run using old or stale field production forecasts that do not reflect the changes to the reservoir since the forecast was first made, especially where current production data is available.

Field development also relies on timely availability of data, in particular, fresh and quality seismic dats that can be quickly interpreted for the field development team. This, in turn, leads to optimum decision-making and reducing project costs to the business.

In short, timely data is recorded immediately and easily available when required.

Data quality problems

Data quality-related problems such as those indicated above can cost E&P companies millions of dollars annually. Revenue opportunities are lost as a result of the inability to make strategic business decisions in a timely manner. To solve data quality problems and achieve the important characteristics of good data, it is necessary to address the root causes of data quality issues.

Data quality issues can be caused by various factors, but data entry processes are arguably the number one culprit. While it is difficult to achieve 100 per cent data quality and eliminate all data errors, it is possible to implement several processes or procedures that can help to mitigate and improve the quality of information and data assets in organisations.

The three main impacts of poor quality data are reduced confidence, increased costs and compromised decision-making. When confidence is reduced, efficiency in exploring, developing and producing new hydrocarbon resources is reduced too. This, in turn, increases safety risks, and can lead to revenue loss and value erosion.

Costs can be increased because poor quality data can affect productivity by as much as 20 per cent, thus reducing the corporate bottom line.

Decision-making is affected by poor quality data because interpretation quality and efficiency is greatly reduced. This can impact on the time required to make important business decisions, leading to missed opportunities.

The three main probloems caused by poor data management are reduced confidence, increased costs and compromised decision-making.

Success of projects, such as Shell's Bongo Floating Production, Storage and Offloading (FPSO) vessel in Nigeria, can hinge on high quality data management and access to reliable information. (Image credit: Shell)

Common E&P data issues

E&P data issues can have a significant impact on business and should be addressed by operators to improve performance.

Common issues with E&P data management include: wrong coordinate reference systems assigned to wellbore directional surveys loaded in data stores; data corruption due to system or application upgrades; wellbore directional surveys loaded without depth units; poorly computed well paths loaded in corporate data stores, incorrect well names across different databases; wrong naming conventions applied to acquired logs or logs acquired with non-standard sample rate, affecting log accuracy in resolving bed thickness and bulk density; and lack of standardised data management procedures, resulting in several versions of the same data or document across an entire enterprise.

Implementing a data quality programme

Implementing a data quality programme is the first step to delivering high quality data.

Data quality programmes seek to provide a structured approach for identifying and mitigating data quality problems. This approach allows every business within the oil and gas industry to standardise, implement, assure, monitor and audit their processes and procedures.

These are used when collecting, storing and analysing the organisation's information and data assets. For any data quality programme to succeed, it is imperative that the programme gets the support of top management. Automation of systems and processes is another way of preventing data quality issues. This can be part of a data quality programme or a standalone enterprise resource planning (ERP) deployment.

There are several proprietary software and application packages that help to monitor data quality on corporate data stores. These ERP solutions can also perform quality checks and flag defects for appropriate action.

Automation helps to reduce quality defects from data entry processes or during data conversion procedures, while also monitoring change logs to prevent errors from sudden unexpected changes to source systems.

However, data quality programmes, together with the implementation of automated systems and processes, are not enough to prevent data defects. There needs to be a step change in employee attitudes and organisational culture towards the optimisation of business processes. This is necessary because most people see data management as additional or peripheral to their day-to-day work.

To resolve this will involve educating, training and initiating a reward system for data quality champions within the business, so that everyone gets to understand that quality data is their personal priority not just that of the organisation's data management department.

As such, the human element cannot be eliminated entirely from high quality data management. There are simple but important steps that staff need to take to ensure data meets the criteria for being of a high standard.

Consistency means standardisation of data, that is, always entering values and information into systems in the same way.

Data needs to be looked at periodically. Regular reviews and assessments are means of periodically checking and reporting on data quality. High quality data demonstrates both internally and to the wider world that the organisation produces high quality work. This improves business confidence around the world.

Unlocking data value

To unlock data value, it is important to establish a structured process framework for data quality management based on proven experiences from leading organisations, such as CDA, and from industry-wide best practices available through professional organisations and experts, such as Professional Petroleum Data Management, Energistics, and the International Association for Information and Data Quality. Additionally, proven experiences from global resources within an organisation are useful for unlocking data value.

It is also important to incorporate and foster the development of networks and partnerships with people and organisations with proven expertise, both within and outside the business.

Existing standards can be used or organisations can consider developing new, robust standards to suit the needs of the enterprise, ensuring that good documentation of all standards and processes is followed.

Management support is essential so a sound business case needs to be presented for high quality data management. This means data should be recognised as a strategic asset, by establishing clear-cut roles for data ownership and governance. A culture of quality in data and information should be instilled through education and training of staff.

> Employing strategies to leverage high quality data will save time, reduce costs and improve the bottom line

Important findings

Measuring The Business Value of Data Quality, a 2011 study by Gartner Inc analysts, Ted Friedman and Michael Smith, came to some important conclusions.

One of the main conclusions from this study was that poor data quality is a primary reason for 40 per cent of all business initiatives failing to achieve their targeted benefits.

Poor data quality can also have negative effects on workforces. The study also found that data quality affects overall labour productivity by as much as a 20 per cent.

As more business processes become automated, data quality becomes the limiting factor for overall process quality.

The report went on to explain the benefits oil and gas operators can enjoy if they implement a data quality programme.

Companies which employ these strategies can leverage high quality data to deliver on a range of business initiatives such as increasing efficiency in exploring, developing and producing new hydrocarbon resources. This will largely save time and reduce costs, thus improving the corporate bottom line.

Reducing the time required for data reconciliation and cleansing can also have positive effects for oil and gas operators. According to Nathanie Rowe in a 2012 report for the Aberdeen Group, *Why Information Governance Must Be Addressed Now*, this could translate to an average savings of five mn man-hours for an average company with 6.2 mn records.

In a low oil price environment, good data management is crucial for companies to stay competitive. (Image credit: Flickr/Sergio Russor)

Most importantly, implementing a data quality programme ensures higher quality data, translating to a single source of truth. This results in greater corporate confidence during analysis, planning and decision-making enhancing business integrity and value. ■

Emmanuel Udeh spoke at the Big Data Analytics for Oil & Gas Conference in Abu Dhabi last year.

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Tank World Expo, the definitive tank storage event for the MENA region, is set to take place from 12-13 April this year at the Dubai World Trade Centre.

Bulk storage leaders converge on Dubai

THE EVENT WILL be opened by the UAE minister of energy HE Eng. Suhail Mohamed Faraj Al Mazrouei who will deliver the keynote address; the show is also officially supported by the UAE ministry of energy.

The two-day event brings together market players from the Middle East and African bulk liquid storage industry, opening doors to supplies and key decision-makers from across the regions.

The recent merging of Tank World Expo and Tank Storage Middle East has also allowed for a greater focus on the African sector all in one place. StocExpo and Tank Storage Portfolio event manager Nick Powell said, "When we acquired Tank World Expo and made the decision to merge it with Tank Storage Middle East, we established the largest bulk liquid event for the region. Having the UAE Ministry of Energy on board as a government supporter is simply fantastic and really strengthens the position of our show."

The event will feature a two-day conference programme led by 18 industry figures from organisations including the UAE ministry of energy, OTTCO, Oiltanking Odfjell Terminals Oman, Dubai Mercantile Exchange, Burgan Cape Terminals and CITAC Africa.

In 2015 the show focused primarily on Fujairah, but the 2016 conference programme intends to reflect the changing market place, with an increased focus on the UAE and the GCC region. With this in mind, Said Al Mawaali, project director at OTTCO, will be presenting 'Latest developments at the region's largest storage facility in Oman'. Executive director at CITAC Africa Gary Still will be presenting 'Assessing storage capacity and infrastructure across Africa in relation to product flow'. Following the African theme will be CITAC Africa executive director Gary Still, who will present 'Assessing storage capacity and infrastructure across Africa in relation to product flow'. He will analyse the African supply challenge, cover the regional demand growth and discuss the investment in infrastructure. Commercial manager at Oiltanking Odfjell Terminals Oman Roderick de Rooij will be looking at the future outlook for the storage market in Oman. He will discuss how to capitalise on the trade routes between Asia and Europe, while analysing the region's demand for storage capacity. He will also explore how best to increase the terminal's efficiency and discuss Oman's future growth ambitions.

The two-day event brings together market players from the Middle East and African bulk liquid storage industry

Many exhibitors will be using the event to launch innovations and technologies to the Middle East and African markets.

Arflu Industrial Valves will be presenting its dual expanding plug valve. Fort Vale will demonstrate its MK3 Safeload semi-automatic bottom loading coupler, with extended 'wrap around' trigger design that follows the profile of the loading adaptor, covering over 60 per cent of the adaptor circumference.

Climbex will be showcasing their fully automated mobile ORECO units for cleaning petroleum tanks, including decanter and disc separators. This system is claimed to be able to work in an inert atmosphere, constantly monitoring the levels of oxygen in a tank, stopping if the maximum permissible concentration level is exceeded.

Emerson Process Management will bring solutions for applications in control and safety systems, custody transfer, overfill protection, terminal management, tank gauging and tank farm management. The idea is to improve safety by sending more data to the control room, reducing manual rounds and streamlining environmental compliance by monitoring overfill, leakage and tank blanketing to control emissions. This is just to name a few; the event has much more in store with exhibitors from allover the world.

Tank World Expo 2016 has been organised by Easyfairs and is supported by Horizon Terminals, ENOC, Fujairah Oil Terminal, Gulf Petrochem, Star Energy Oil Tanking, Emerson Process Management, Kanon Loading Equipment, ATECO Tank Technology Engineering, Endress+Hauser among others.

Last year's show inauguration (Photo: Easyfairs)

Leaders from the entire oil and gas value chain and the world of finance will be on hand at the Africa Independents Forum to address the big issues that are facing the industry.

London is the location for African independents

There will be plenty of great networking opportunities on offer at the African Independents Forum.

FROM 25-26 MAY, leading independents and corporate players worldwide and from across Africa will meet in London to discuss the big issues currently facing the oil and gas industry. Conference participants at the Africa Independents Forum will include listed and unlisted companies of all sizes, established players and new entrants.

The entire value chain will be covered at the forum, with delegates able to meet with leaders from the wider African upstream sector, exploration and development. Additonally, analysts and experts from geoscience firms from Africa, Europe, the US, Australia and Asia.

Global Pacific & Partners and ITE Group will be hosting the event.

Financing the future

Access to finance is a critical issue for operators across Africa, especially in emerging markets. As such, corporate leaders and leading figures from the finance world will be on hand to discuss ventures, current strategy, deal flow, crude oil and the role of financial markets, particularly in the ongoing low oil price environment, which presents challenges across the entire industry.

Equity financiers, banks, private equity, transaction advisers, and investors found on the AIM and LSE, in London, Paris and Frankfurt, will all be present.

Speaker highlights

The forum will benefit from 40 top level speakers from around the world. On 24 May, Duncan Clarke, chairman, Global Pacific & Partners, will present in London for the first time his 18th 'Scramble for Africa' strategy briefing.

The speakers will be offering unparalled corporate insights into current and emerging exploration plays, capital development projects, corporate E&P strategies, and how to unlock Africa's large and yet-to-be-found hydrocarbon reserves. Other topics which will be addressed by the speakers include the state of the African geo-economic landscape, the political economy of oil, and the main issues which will shape the future funding of companies and ventures in the African upstream sector.

All attendees are invited to the 75th PetroAfricanus Club reception on 25 May, where the guest speaker will be Phil Loader, vice president of global exploration for Australian energy giant, Woodside Energy.

On May 26, the 6th Global Women Petroleum & Energy club will be holding a luncheon where the guest speaker will be Irini Katsiani Hughes, business development manager for the EMEA region for Statoil.

Special panel sessions will also be held on finance for the energy industry, featuring major investors and institutions which fund and finance equity and debt for corporate oil and gas operators across Africa.

Leading government speakers at the form include HE Mohamed Muktar Ibrahim, Minister of Petroleum and Mineral Resources, Somalia; and Dr Ahmed Abdel Fattah, Deputy CEO for exploration, for EGPC, the Egyptian state petroleum company.

Companies represented among the confirmed speakers include Tullow Oil, Noble Energy, ERHC Energy, Circle Oil, Lakeside Resources, Africa Fortesa Corporation, Africa Oil Corporation, Rystad Energy, Svenska Petroleum Exploration, Mirabaud Securities and Chariot Oil & Gas.

Exhibition opportunities

As well as the impressive panel of speakers, there will be a showcase at the forum. This will feature leading independent companies with acreage and portfolio assets held in the Gulf of Guinea, north-west Africa, Maghreb-North Africa, central Africa, eastern and southern Africa, and in the landlocked and littoral frontier states. ■

- *For more information: www.globalpacificpartners.com or www.africa-independentsforum.com*

The forum will feature unparalled corporate insights into current and emerging plays, capital development projects and corporate E&P strategies, as well as how to unlock Africa's large and undiscovered hydrocarbon reserves.

Lagos saw visitors arrive from all over the world during the 20th anniversary of Offshore West Africa conference and exhibition held from 26-28 January this year

Positioning Africa for a sustainable future

At the inauguration of the event (Photo: Pennwell Corporation)

SPONSORED AND ENDORSED by Nigeria's National Petroleum Corporation and Department of Petroleum Resources respectively, the 20th anniversary Offshore West Africa Conference and Exhibition saw more than 2700 visitors and delegates from more than ff countries around the world

Sponsored by the Niger Delta Science, Technology and Bioenterprise Development and the Federal Ministry of Science & Technology, the event allowed the participants to attend the exhibition and listen to presentations from various local and international companies.

The conference sought to address key technology and developmental issues for the West African offshore oil and gas market through a comprehensive educational conference programme and three-day exhibition. The theme adopted for the event was 'Positioning for a Sustainable Future'.

The conference sought to address key technology and developmental issues for the West African offshore oil and gas market.

The three-day exhibition as part of Offshore West Africa comprised of both prominent local and international organisations displaying their latest products, services and industry innovations. this included names like Ariosh, Chevron, DNV GL, JC International, Richardson Oil & Gas, Royal IHC, SNEPCo, TOTAL E&P, Westfield Subsea and many more.

The event began with the opening plenary session to just under 350 people that included opening remarks by Total E&P Nigeria managing director and chief executive Nicolas Terraz, keynote addresses by Ghana National Petroleum Corporation CEO Alexander K. M. Mould and Federal Institute of Food and Industrial Research Oshodi (FIIRO) director general Dr. Gloria Elemo. An ExxonMobil energy outlook was presented by the general manager of deep water operations & joint interest assets at Esso Exploration & Production, Oladotun Isiaka.

The opening plenary was followed by a special award presented to Shell Nigeria Exploration and Production Company (SNEPCo) managing director Bayo Ojulari for his support of the Offshore West Africa event over the last 20 years.

Over the three days, the two-track conference schedule included sessions covering a number of industry critical topics such as subsea technology, sustainable development, asset integrity, deepwater projects, field development, flowlines & pipelines, deepwater trends & challenges, major project management, production optimisation, and regional trends & challenges acquire.

A symposium on the topic 'strategies for local, regional and international collaboration and effective local content delivery' was also conducted that offered lively debate between the panel members. These panellists included LADOL business development executive director Jide Jadesimi, Ghana Petroleum Commission director of special services Kwaku Boateng, African Energy Association country director for Nigeria Tosin Yusuff, Shell Petroleum Development Company of Nigeria general manager Chiedu Oba and Nigerian Content Development and Monitoring Board projects and operations general manager Paul Zuhumben.

As part of a collaboration between Offshore West Africa, the Energy Institute Nigeria and Lonadek, a youth empowerment programme was also held for the duration of the event for a selected group of students and young professionals.

Pennwell Corporation, owner of the event, announced that the next Offshore West Africa Conference and Exhibition will be organised in Lagos again next year on 24 January. ■

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JIP codes for vital offshore equipment

Coherent standards are necessary for offshore operations.

A GROUP OF companies and organisations have joined forces to develop codes for offshore cable- and pipe-laying equipment. Aquatic Engineering & Construction Ltd and DNV GL are among the companies involved in this joint industry project (JIP).

It is a three-phase project involving big-picture mapping to understand the equipment required; detailed mapping to focus on individual components required; and, finally, the creation of industry guidelines and a glossary of common terms for offshore cable- and pipe-laying equipment. The first two phases of the JIP are expected to be completed this year.

Dr. Eng Marius Popa, lead naval architect for DNV GL commented; "The JIP will deliver a decision tool that can be used by all stakeholders during the specification, design, manufacture, and approval of any equipment intended for use in offshore cable/pipe-laying and recovery."

First orders secured for new gelling agent

CONFI-GEL, A NANO-ENGINEERED gelling agent developed by Graphene NanoChem, has been commercially deployed for the first time, thanks to an order from Scomi Oiltools.

Before placing the $33,300 order with Graphene NanoChem, Scomi undertook more than six months of comprehensive trials of Confi-Gel, an additive in base-drilling fluids designed to decrease fluid loss to the well surroundings and assist with wellbore stability during drilling activity.

Confi-Gel is a viscosifier which is characterised by its microstructure. This allows for precise customisation and integration. It was developed to complement Graphene NanoChem's PlatDrill series of products. The PlatDrill range comprises graphene-enhanced oilfield chemicals with good thermal conductivity for high-temperature operations, friction-reducing capability, and viscosity stability. As with Confi-Gel, Scomi formed a partnership with Graphene NanoChem to undertake intensive testing and customising of the products.

Initially, Scomi will deploy Confi-Gel for use in Pakistan in the first quarter of 2016. After this, Scomi plans to gradually introduce the product to its supply chains in Turkmenistan, Indonesia, Thailand, Vietnam, Myanmar and India.

Jespal Deol, chief executive officer of Graphene NanoChem, is upbeat about the order from Scomi, despite the low oil price marketplace: "The oil and gas market has suffered significant downturn from the volatility of oil prices, and the fact that our product addresses the industry pain-points has generated significant traction in the commercialisation of our oil and gas product range."

The viscosifier market is estimated to be worth US$20 mn globally.

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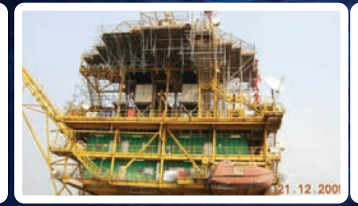

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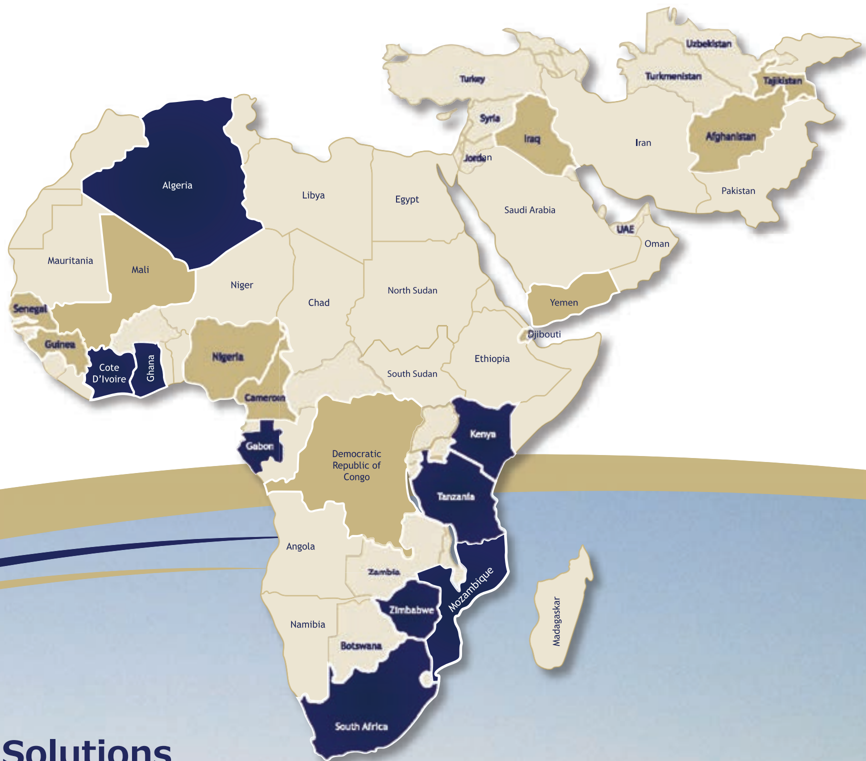

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