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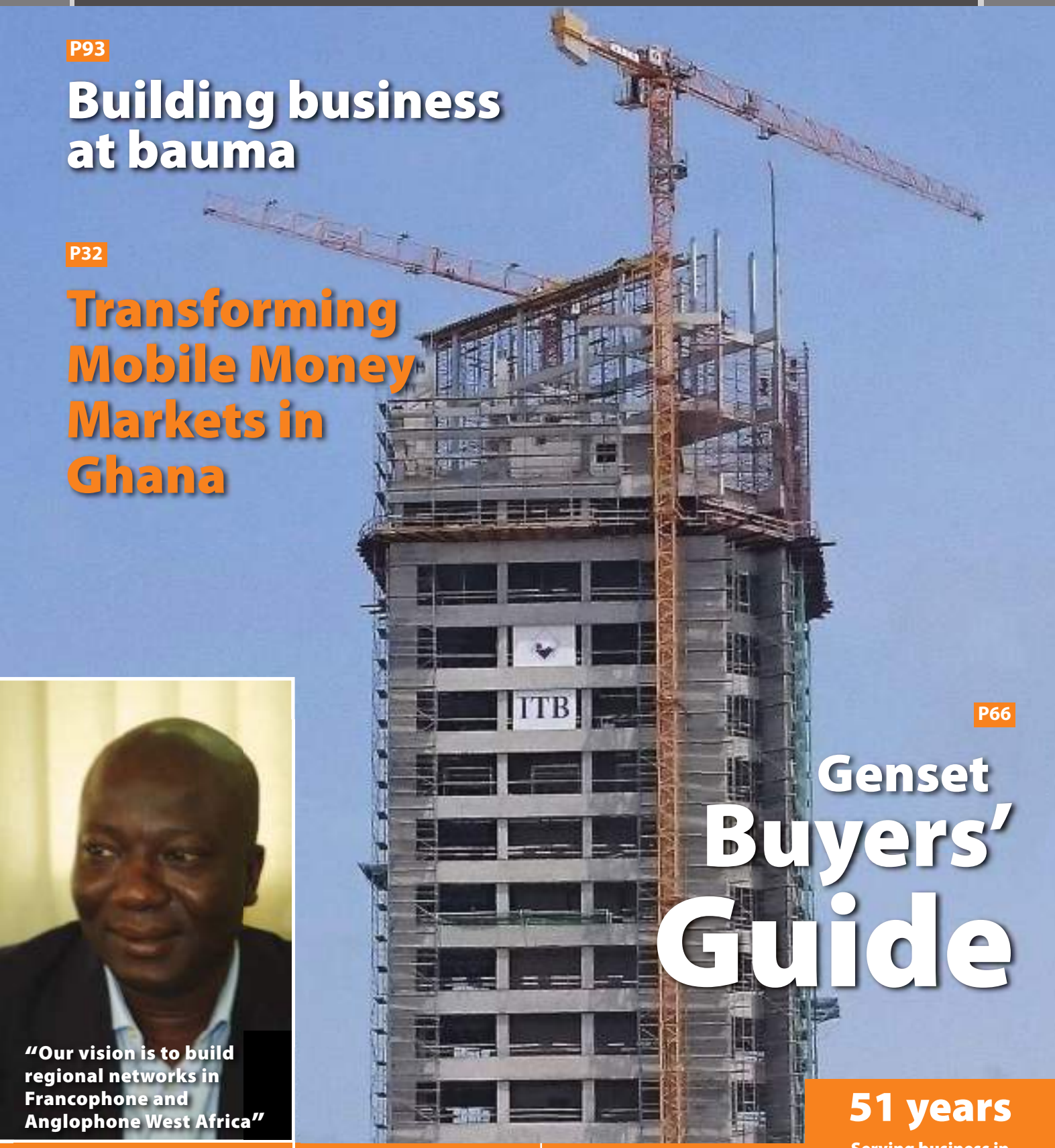
April 2016

# African Review

of BUSINESS and TECHNOLOGY

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## Genset Buyers' Guide



**"Our vision is to build regional networks in Francophone and Anglophone West Africa"**

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# Editor's Note

This issue of African Review looks forward to the business and networking opportunities at two key South African trade shows, AB7 and SAITEX, previewed on page 22. There follows an assessment of Africa's integration into global value chains from page 24 to 28, with reports on banking technology and mobile financial services in West Africa on pages 30 to 34. Developments in transport and logistics are covered on pages 35 to 42, with environmental technology explored on pages 43 and 44, and energy sector prospects at Oil & Gas Africa on page 46.

The power section begins on page 48 with an interview with Pétro Ivoire director-general Sebastien Kadio-Morokro, who discusses petrol and gas distribution in Côte d'Ivoire. Reports on technology and maintenance at utilities follow on pages 50 and 52. This issue then offers insights into renewable energy on pages 55-56. Articles appraising the design and use of diesel generators follow on pages 57 to 84, with the annual African Review Genset Buyers' Guide on pages 66 to 83. Reports from the construction and mining sectors include a comparative assessment of Volvo's L120Gz wheel loader on pages 88 and 89, an article on concrete for quarrying in East Africa on pages 90 and 91, and an extensive preview of bauma 2016, the world's largest showcase of construction and mining machinery, from page 93 to 98.

**Dr Andrew Croft**, Editor

**Cover picture: ITB Tower, which is under construction in the Eko Atlantic development off Victoria Island, Lagos, on newly reclaimed land from the Atlantic Ocean.**
**Inset, bottom left: Stephen Williams**

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# Agenda / North

## Volvo invests in Moroccan training

A new training academy in Settat is being actively assisted with financial, technical and equipment support provided by **Volvo Group**. As part of a programme to support the development of vocational training schools in Africa, the training school aims to provide a modern facility that will become a center of excellence in developing skills for industrial applications.

The newly-built academy is based on an 84 hectare campus in Settat, some 60km from Casablanca, and features training workshops, halls of residence, classrooms, auditorium and restaurant. Such is the importance given to boosting the country's skills gap, the school had the honour of being formally inaugurated by the king of Morroco, His Majesty King Mohammed VI.

The Volvo-supported project will provide technician training to 150 students from Morocco, Senegal and Ivory Coast annually on a wide range of construction equipment, and forms part of the school's objective to train up to 2,000 students a year. In Morocco, Volvo is joined on the project by fellow partner **USAID**, **United Nations Industrial Development Organisation (UNIDO)**, the **Government of Morocco** and the foundation of the country's largest mining company, **OCP Foundation**.

As the private sector expert who understands better than most the limitations in the jobs market, Volvo is expected to help develop the curriculum, train the trainers and provide technical assistance and training equipment. (It has provided both electrical and hydraulic benches.) Also, as Volvo and its implementation partner UNIDO have experience of a very similar project in Ethiopia, Volvo can help define skills training best practices in developing countries.

To date, Volvo has provided a D7 engine, a D16 engine and sundry other equipment, including tools and components as well as advice on the development of the curriculum and access for the school's teachers to Volvo on-line training material. Volvo is about to deliver 14 engines for the school in the near future. The school has also bought six Volvo machines, including a paver, hauler and graders.

"As the local dealer, we at Volvo Maroc will provide practical support and assistance to the school and students, with regard to site visits, access to our workshops and securing work placements with suitable Moroccan companies," said Tim Richardson, general manager of Volvo Maroc's Construction Equipment Division.

## Dr Salah Khebri introduces Algerian energy initiative at NAPEC

Recently held in Algiers, the 6th North African Petroleum Exhibition and Conferences (NAPEC) was attended by unprecedented numbers of industry professionals, representing 400 companies from 28 countries.

NAPEC is the largest North African oil and gas exhibition and conference. The 2016 event drew speakers from the highest echelons of government, operators, service providers, advisory and research firms and academia.

Algerian Energy Minister Dr Salah Khebri opened NAPEC and used the event to announce Algeria's new energy objective

Delegates heard from Algerian Energy Minister Dr Salah Khebri on Algeria's priorities in the upstream and downstream sector, on plans for exploration in previously unsurveyed areas, expansion of reserves and production, and two new refineries due to come on-stream by 2020. Other keynote speakers addressed important issues facing Algeria and the international oil & gas market.

**Sonatrach** CEO Amine Mazouzi said, "NAPEC is an important platform and opportunity to create links and partnerships with business."

Sonatrach experts addressed the delegates on a variety of topics including: petroleum at a time of financial and economic change, Sonatrach's research and development activities, liquified natural gas in Algeria and Sonatrach's programme to cut greenhouse gas emissions.

NAPEC organiser Djafar Yacini observed, "Sonatrach contributed greatly to the success of the event together with the specialist speakers and those companies that have exhibited, and of course the industry professionals that attended."

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# Agenda / East

## Demand for cement expected to increase in Uganda

The rise in a number of big infrastructure projects boosted by the high levels of public and private investments in roads, power plants, commercial construction and property development are expected to increase the demand for cement in Uganda at a faster rate of 13 percent annually - outpacing the nation's GDP of seven per cent and the national electricity demand at ten per cent in the years ahead.

According to **Hima Cement**, a subsidiary of **Bamburi Cement Limited**, which itself is owned by **Lafarge**, companies are strategically positioned to meet demands arising from the construction boom in Uganda. Indeed, Hima Cement recently launched its Bulk Cement delivery service, which offers contractors a more efficient mode of receiving cement at their construction sites thus reducing logistics costs associated with handling bagged cement.

"This mode of delivering cement is the standard practice in developed countries. Uganda is on a rapid growth path and as a key player, we are ready to meet the demands in this market. We are evolving from being a producer of cement only, to a partner for solutions," noted Daniel Pettersson, Hima Cement Country CEO.

Each truck has a capacity to transport 28 to 32 tons of cement which implies a cleaner environment and faster completion of projects as less time is spent loading, unloading and emptying the cement from bags. This will also save contractors from pilfering and tearing losses.

In 2010, the company made a significant investment to increase production capacity to 850,000 tons annually when it commissioned a new production line worth US$120mn with adequate installed capacity to meet the growing demand. The new line increased production capacity from 350,000 tons to 850,000 tons per year and

Hima Cement is a Lafarge subsidiary company

has helped to move Uganda to self-sufficiency in addition to facilitating supply of quality cement to the entire East African market.

Hima Cement produces a range of packed and bulk products that meet the requirements of many different types of application and mentions PowerMAX 42,5 which is a premium cement that combines excellent strength performance at all ages with versatility and enhanced durability benefits and combines high technical performance for large projects with all round versatility for the small user. It is also used for ordinary constructions, foundation works and soil stabilisation. Another type of cement, PowerPLUS 42,5 N, locally known as Ordinary Portland Cement, is utilised very efficiently in medium to large construction projects to optimise performance.

Structural applications/reinforced concrete for the cement include high rise buildings and structures, bridges, fast track construction projects, spun pipe manufacturing, foundations, pre-cast manufacturing and post-tensioning and pre-stressing slabs and beams among others.

*Geoffrey Muleme*

## Representing growth in Mozambican extractive industries at MMEC

The bi-annual international strategic conference on Mozambique Mining, Oil & Gas, and Energy sector (MMEC) has become established as the leading strategic conference on Mozambique's extractive industry since the inaugural event in 2008.

Organised by **AME Trade Ltd** in association with **ENH** and **AGMM**, MMEC is a unique platform designed for networking with policy makers, investors, and experts in Mozambique's mining, oil & gas and power generation sectors. This year the fifth MMEC will again allow access to an unrivalled selection of interrelated topics under one roof.

The event will feature the long-established MMEC expo which will provide a platform for companies and organisations to market their goods & services in Mozambique. Taking place this year on 27-29 April, MMEChas previously attracted 60 exhibitors and 600 participants from 32 countries, and sponsorship from key industry players including **Anadarko**, **Sasol**, **Matola Gas Company SA**, **ExxonMobil** and **Standard Bank**.

Organised under the theme of 'Connecting investors, policy makers and industry leaders to drive economic & social development in Mozambique', the conference will feature over 40 presentations covering mining, oil & gas, and power sectors, as well as panel discussions addressing skills development, regulatory developments, anticipated local content policies, and other related issues.

Speakers at this year's event include:

- James M Hughes, country manager, **Fluor Mozambique**.
- James Shepherd, managing director, Southern and East Africa, **Aggreko**.
- Isaque Chande, commissioner, **CNELEC National Council for Electricity**.
- Pedro Pinto, partner, African **Century Real Estate**.
- Paul Eardley-Taylor, head of oil and gas Southern Africa, **Standard Bank**.
- Johan de Vos, MD, **Gigawatt Moçambique SA** and Chairman, **Matola Gas Company**.
- Barbara Mommen, chief executive officer, **Maputo Corridor Logistics Initiative**.
- Dr Miquelina Menezes, chief executive officer, **Funae**.
- Miguel Barreto, chief executive officer, **Gesto Italia**.
- Moises Machava, head of engineering and maintenance, **Hidroeléctrica Cahora Bassa**.

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# Agenda / South

## Energas exhibits at Energy Indaba

Africa Energy Indaba was a great success for Energas Technologies

Equipment supplier to Southern African oil and gas industries, **Energas Technologies** recently exhibited at the Africa Energy Indaba in partnership with its supplier, **Turboden**, a developer and producer of ORC (Organic Rankine Cycle) turbogenerators.

Energas Technologies sought to connect with the suppliers, decision-makers and key role players in Africa's energy sector brought together at Afria Energy Indaba.

"The event was a great success for both Energas Technologies and Turboden," remarked Laetitia Botha, Energas Technologies product engineer.

Partnering with Turboden, European specialist in turbogenerators, Energas was able to highlight the benefits of its innovative and reliable energy solutions for industry in greater depth. Comments Botha, "This partnership was important for us, because we wanted to bring Turboden's ORC turbogenerator solutions, which have great potential in harnessing Africa's waste energy, right under the view of our existing and potential customers at the event."

With a chronic shortage of electricity in Africa, a developing continent whose energy requirements are set only to increase as infrastructure demands grow, a number of visitors to the Energas Technologies booth showed a keen interest in energy generation and recovery in the South African and wider African contexts.

Botha commented, "Africa boasts significant natural resources, such as gas, minerals and timber, which have great potential for energy production, and while many people are aware of this, creating or recovering energy from these resources is a challenge for most."

## Adfil backs Chryso for fibre sales

The **Adfil Construction Fibre** division of UK-based **Low & Bonar Group** is partnering with concrete and cement admixtures and ancillary products supplier **Chryso Southern Africa** in order to achieve growth for its fibre business into Africa.

"Many countries in Africa have huge infrastructure programmes to build roads, water systems and power stations to meet the demands of the world's second most populous continent. Adfil recognises the growth opportunities and chose Chryso as its preferred partner with the view to increase our fibre market share in Africa," Mark Mitchell, technical sales manager for Adfil Fibres, said. Adfil has almost three decades of experience in the development, production and distribution of fibres in over 60 countries.

Chryso will distribute Adfil's micro fibres and macro fibres, and manage a concrete slab design programme

## Nautic Africa secures Citrans contract

South African shipbuilder **Nautic Africa** has signed a significant agreement with **Citrans** to build the first ferries in a series of vessels for the Ivory Coast worth R347mn (US$22.6mn). The deal forms part of a Presidential infrastructure project that aims to reduce urban congestion in Abidjan.

Phase one of the project, which will deliver 18 vessels by September 2016, highlights Nautic's ability to design and build to the specific requirements of the international market. A focus on vessel stability, comfort and competitive costing has resulted in a twin-hulled design concept for the newbuilds.

Due to operate in shallow inland waters, the 27m long ferries are designed with a maximum water draft of just 1m and air draft of 4m. The catamaran-styled vessel design is guided by the **International Association of Classification Societies' (IACS)** rules to keep passengers safe and comfortable.

With operating speeds of up to 12 knots, the ferries will be fitted with various seating arrangements in 200-seater and 240-seater versions. Configurations for economy as well as business class seating will see some of the vessels catering either for business or economy class completely or for a varying percentage of both.

Highlighting the importance of safety in vessels focused on passenger transport, Nautic confirms that each vessel is to be delivered with life saving safety equipment as well as a variety of alarms and sensors. Passenger comfort is ensured with toilets and air conditioning throughout the vessels. In addition, four boarding ramps provide quick and efficient access onto and off the vessel.

The ferries will benefit from Nautic's commitment to building to the highest specifications using the latest technology for an end product that is efficient and robust to ensure an extended service life.

# A Powerful Partnership

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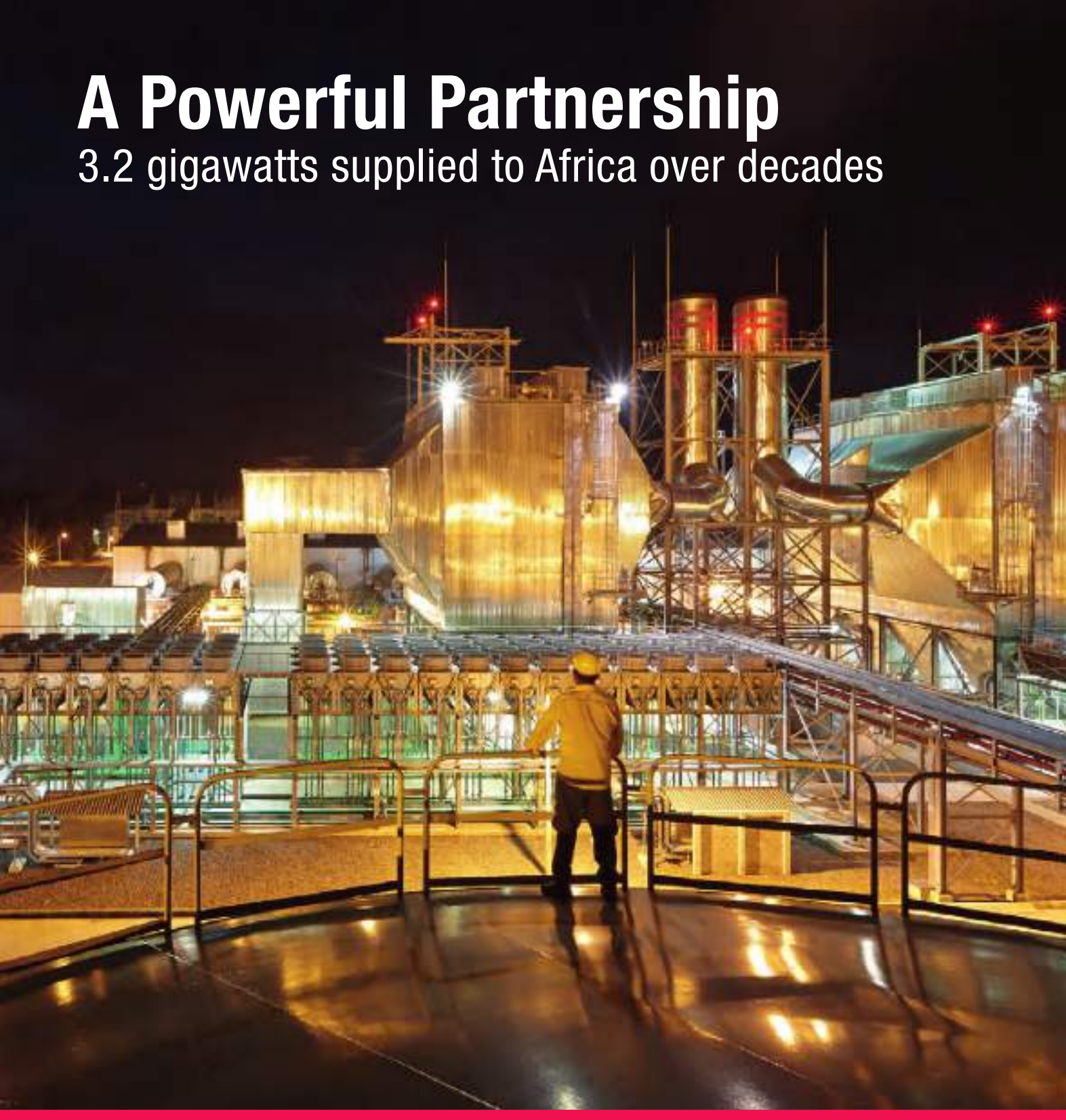

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# Agenda / West

## Africa's insurers speak at the annual Journée de la Finance

Insurance policy holders in Africa can now expect greater gains in their portfolios in the coming years, according to African private equity fund management firm **AFIG Funds**. This as financial institutions such as bankers and private equity players continue to engage African insurers with ambitious growth strategies for insurance at the annual Journée de la Finance.

The event, now in its fifth edition, was held in Abidjan, Côte d'Ivoire, with the goal of increasing partnerships and synergies between financial and insurance institutions. Over 194 companies from 29 countries in North and Sub-Saharan Africa were present to listen to finance and insurance industry leaders from across the region.

"With over US$50bn of collected premiums each year across the continent, and unprecedented year-on-year growth, it is important that African insurers think more strategically at where they invest their portfolios," said Papa Madiaw Ndiaye, founder and CEO of AFIG Funds.

The annual daylong event was the brainchild of AFIG Funds, and the **Federation of African Insurance Companies (FANAF)**. The inaugural event took place in 2010, in Kinshasa, Democratic Republic of Congo, with the goal of improving the insurance industry's investment portfolios. The event is held annually as part of FANAF's weeklong general assembly, which gathers more than 1,000 participants every year. This year's Journée de la Finance featured the CEO of **BRVM**, Edoh Kossi Amenounve, and the group MD of **NSIA**, Janine Be?ne?dicte Diagou, as well as representatives from the **African Development Bank**, **Agence UMOA Titres**, **AXA Mansard**, **Bank of Africa**, **Deloitte**, **Ecobank**, and **Group SUNU Assurances**. Also present were **CIMA**, the sector regulator, as well as leaders of tomorrow such as the CEO of **Quick Cash**, and an astute observer of and active participant in the continent's economy, Eric Kacou, who challenged the audience on what the growth and the emergence of the continent mean.

"At present, the portfolios of African insurers are essentially made up of real estate investments, term deposits and low yield debt securities. These can either be potentially risky or produce low yields," said Monira Diallo, investment manager at AFIG Funds. "The result is an industry where revenues are increasing but profits are not. A shift to diversify their investment strategies into public markets and alternative assets is key to sustained growth."

## Calls for progress in tech, science

The first global forum for science on African soil has taken place in Dakar, Senegal, with a global call for support for Africa's scientific and technological emergence. The Next Einstein Forum (NEF) brought together leaders in industry, policy, science, and technology. The first edition of this biennial event set the stage for a vibrant conversation on transforming Africa and the world through a renewed and increased focus on science, technology and innovation. The NEF is an initiative of the **African Institute for Mathematical Sciences (AIMS)** in partnership with **Robert Bosch Stiftung**.

"A great idea can come from anywhere in the world, and there is no doubt that new and novel scientific ideas to solve global health challenges will come from Africa.," said Seema Kumar, vice president, innovation, global health and science policy at **Johnson & Johnson**, and a member of the NEF International Steering Committee.

## Visa expands footprint in Francophone Africa

Payment company **Visa** is preparing to open an office in Côte d'Ivoire to reinforce its position as a leading payments technology company and to help bringing the benefits of electronic payments to the economy and a broader range of consumers and merchants across the region.

Visa is currently in the process to finalising the procedures leading to the opening of its office in Côte d'Ivoire. This will facilitate the engagement with key stakeholders in the region; government, financial institutions, consumers and merchants in the ECOWAS region.

This important development will help drive the company 'strategy in Africa where two billion people live without access to financial services, according to the Global Financial Inclusion Index 2014. The expansion signals continued efforts by Visa to drive its undertaking with the **World Bank Group** to achieve universal financial access and providing electronic payment accounts to 500mn underserved people by end of 2020.

HE Koné Adama, Ivorian Minister of Finance, expressed his support to plans shared by Visa and said, "This is indeed great news, it will help Côte d'Ivoire in its endeavors to promote electronic payments in the country and drive financial inclusion to the benefit of the overall economy."

HE Jean-Louis Billon, the nation's Minister of Commerce, indicated, "This is encouraging news for 2016, Côte d'Ivoire is currently exerting significant efforts in attracting foreign direct investments and facilitate commerce and electronic payment will help in increasing the transparency of the economy to that end. Visa is welcome to the region".

HE Roger Kacou, Minister of Tourism, said, "We are pleased with the plans shared by Visa and it will definitely help in attracting tourists to visit Côte d'Ivoire and we look forward to our partnership with Visa to execute campaigns that would result in the promotion of the country as a destination of choice for tourists."

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# Events / 2016

## May

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Maputo, Mozambique
www.Southern-Africa-Summit.com

**5-6**
### Africa Financial Services Investment Conference
London, UK
www.afsic.net

**6-8**
### Next Generation Oil & Gas
Accra, Ghana
www.gdsinternational.com

**7-9**
### Indaba
Durban, South Africa
www.indabasouthafrica.co.za

**9-11**
### Africa Construction
Johannesburg, South Africa
www.constructionweek.com

**11-13**
### Networks, Computers and Communications
Hammamet, Tunisia
isnccconf.org

**11-13**
### World Economic Forum on Africa
Kigali, Rwanda
www.weforum.org

**12-14**
### Oil & Gas Africa
Nairobi, Kenya
www.expogr.com

**12-14**
### Power & Energy Africa
Nairobi, Kenya
www.expogr.com

**17-19**
### African Utility Week
Cape Town, South Africa
www.africanutilityweek.com

**18-20**
### Indusmach
Nairobi, Kenya
www.expogr.com

**23-26**
### Design East Africa
Dubai, UAE
www.indexexhibition.com

**24-25**
### IOTAS
Johannesburg, South Africa
www.iotafricasummit.net

**24-26**
### A-OSH
Johannesburg, South Africa
www.aosh.co.za

**24-26**
### Securex
Johannesburg, South Africa
securex.co.za

**26-28**
### Semica
Ouagadougou, Burkina Faso
www.semica.net

**30 May-3 Jun**
### IFAT
Munich, Germany
www.ifat.de

## dmg events acquires Exhibition Management Services (Pty) Ltd South Africa

Leading event company **dmg events** has acquired long-established pan-African exhibition organiser **Exhibition Management Services Pty Ltd (EMS)** – headquartered in Johannesburg, South Africa. dmg events is a wholly-owned subsidiary of the Daily Mail & General Trust plc, an international portfolio of digital, information, media and events businesses.

Geoff Dickinson, CEO of dmg events, said, "This acquisition is part of our strategy to become key event players in Africa. EMS offers a strategic hub in Africa's largest economy."

EMS adds five shows to the existing portfolio of dmg events:

- SAITEX – A non-food retail products exhibition.
- Africa's Big Seven (AB7) – The continent's biggest food and beverage industry trade expo.
- WAMPEX – Mining and power, machinery and technology, Ghana.
- INDUTEC – Industrial design and manufacturing expo.
- CIS – An industry showcase in Cape Town, covering the oil & gas, marine and offshore, logistics and temperature controlled warehousing sectors together with relevant small business suppliers.

dmg events now operates 12 events across the continent, including construction and interiors in Morocco, oil and gas in Egypt, construction and coatings in Kenya, and the Global African Investment Summit that takes place in London, UK, and in Kigali, Rwanda.

The Johannesburg-based company will change its name to dmg EMS Africa, reporting to dmg events' Middle East, Asia and Africa division that operates some of the largest exhibitions in the region. These include The Big 5 series of construction events, INDEX – the interiors event in Dubai, and The Hotel Show – the Middle East's biggest Hotel and Hospitality event.

Matt Denton, president of dmg events – Middle East, Asia & Africa, said, "The team and I are excited about the events and opportunities that this acquisition opens to us in Africa. We can build significantly on the existing successful EMS events and already have plans to grow the business with fresh launches supported from our new Johannesburg hub."

John Thomson owner and founder of EMS in 1981 said, "dmg events with its extensive portfolio of events, international networks and financial resources is the ideal organisation to further develop and expand upon the portfolio of exhibitions that we have established over 35 years in Africa."

The sale was brokered by Mayfield Media Strategies, specialist brokers for the global exhibitions sector.

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# Bulletin / Energy

## Republic of Djibouti ready to work on mega gas project

His Excellency President Ismaïl Omar Guelleh of the Republic of Djibouti has presided over the foundation stone laying ceremony for a new mega gas project, which comprises a natural gas pipeline, a liquefaction plant and an export terminal at Damerjog, Djibouti, which will enable Ethiopia to export gas to China and support regional socio-economic development; with project funding by Chinese firm **POLY-GCL Petroleum Group Holdings Ltd**, the 700km pipeline will transport up to 12bn cubic metres of natural gas a year from Ethiopia to Djibouti, and the liquefaction plant will have capacity to produce up to 10mn tons of liquefied natural gas (LNG) per year after completion of the project.

## Improving investment in Mozambican energy

**Gigawatt Mozambique** has announced a US$200mn investment into Mozambique's power sector, alongside several global stakeholders including **Standard Bank** and the **World Bank**, amongst many others, to assist in harnessing Mozambique's natural-gas resources, which will further benefit many of Mozambique's neighbours in southern Africa; this - along with several other projects in the region - is presented and discussed at **EnergyNet**'s 2016 Southern Africa Energy and Infrastructure Summit (SAEIS), taking place in Maputo, Mozambique, 4-6 May, as part of a celebration of regional co-operation, and promotion of energy and infrastructure projects require both private- and public-sector support in order to be realised.

## KPMG leads on renewable dialogue with SAICE and SAREC

Industry consultants at **KPMG** recently demonstrated fresh commitment to promoting South Africa's renewable energy sector, in collaboration with **South African Institution of Civil Engineering (SAICE) Project Management and Construction Division (PMCD)** and the **South African Renewable Energy Council (SAREC)**, at a renewable energy seminar, attended by around 100 delegates; of the seminar, Malcolm Pautz, KPMG's associate director in deal advisory infrastructure, said, "This was a critical platform on which we raised standards, heightened awareness, shared experiences, and educated all stakeholders on the various complexities that are prevalent in the sector."

## HopSol selects First Solar modules for Namibian PV plant

Swiss solar developer **HopSol AG** has selected **First Solar, Inc** to supply high performance thin film modules to power the Otjozondjupa Solar Park, located near Grootfontein in Namibia; when completed in June 2016, the five megawatt (MW)AC facility will be Namibia's largest grid-connected solar photovoltaic (PV) plant and is expected to account for approximately one per cent of the country's total generation capacity.

## Econet's Strive Masiyiwa set to speak at World Energy Congress

The **World Energy Council**, which organises the 23rd World Energy Congress, taking place in Istanbul, between 9 and 13 October, has confirmed that Strive Masiyiwa, group executive chairman and founder of **Econet** in South Africa, will speak alongside Wang Binghua, chairman of **State Power Investment Corporation (SPIC)** ofChina, and Maximus Johnity Ongkili, Minister of Energy, Green Technology and Water of the **Government of Malaysia**; the World Energy Congress, which gathers senior leaders from all segments of the energy community and is attracting speakers with global reputations from senior figures in politics, business and academia, will dedicate its fourth day to an focus on Africa and its role in securing a stable energy future, recognising the potential and growth opportunities the continent will unlock in the future.

## Vanguard enables completion of wind turbines at Nojoli

International heavy-lift, specialised transport and plant installation company **Vanguard** has been awarded the transport and crane erection contract for the Nojoli Wind Farm near Cookhouse in the Eastern Cape, once again showcasing its experience in this sector and its specialised engineering solutions; the Nojoli project comprises 44 **Vestas** V100 2 MW wind turbine generators, which have the capacity to generate more than 275 GWh per year or enough for 86,000 South African households.

# Bulletin / Energy

## New power plant covers 15 per cent of Senegal's electricity consumption

MAN Diesel & Turbo has completed the construction of a new diesel combined cycle plant in Tobène in Senegal, 90km north of Dakar. Designed to operate with five MAN 18V48/60 engines and a MAN MARC steam turbine, the new power plant has a production capacity of up to 96 MW. It is the second plant in Africa to make use of MAN's diesel combined cycle product package. The waste heat from the engines powers a steam turbine, which in turn generates 6.6 MW of electricity. The power plant, which is located in the region of Thiès, will supply to the national grid that is operated by Senegal's national electricity company, SENELEC. It will generate the equivalent of 15 per cent of the country's current electricity consumption. This electricity will be used to power businesses, shops, universities and houses, thus providing a whole host of new opportunities for growth within Senegal, which currently experiences recurring power outages.

"The new plant uses our diesel combined cycle product package, which offers outstanding performance and excellent environmental standards. Thanks to the second cycle using a MARC steam turbine, fuel consumption is lowered by six per cent and CO2 emissions are also reduced for any kWh produced," said Mesut Yentur, CEO of MAN Diesel & Turbo France and head of power plant sales in the French-speaking regions of Western Africa. Thanks to its effective partnership with MATELEC, a Lebanese company specialising in electricity infrastructures, MAN has managed to get the plant commissioned in record time. "We are very happy with this project," says said

The new power plant in Tobène will supply electricity to Senegal's national grid

Sami Soughayar, CEO of MATELEC. "Our collaboration with MAN Diesel & Turbo proved to be highly professional and a great success. With project teams being perfectly coordinated, it only took just over 15 months for the power plant to be able to deliver its first MW to the Senegalese national grid."

# "Quotes"

"Djibouti sits at the crossroads of one of the busiest shipping routes in the world, linking Europe, the Far East, the Horn of Africa and the Gulf. It is a natural gateway for Africa, providing sea, air, rail and road links."

**Ali Mahmoud Yacoub, Minister of Energy, Republic of Djibouti**

"The true economic empowerment of Africa lies in its capacity to truly engage and compete on a level playing field in the global stage. It is essential for Africa not only to have access to basic essentials such as water and energy but also connectivity, which will enable the continent to truly capitalise on the digital revolution."

**Marco Attisani, chief executive officer, Watly**

"Cooperating with Afreximbank is an excellent way for Ecobank to prosecute one of the objectives of its founding fathers, which is to contribute to the development of the continent."

**Ade Ayeyemi, group chief executive officer, Ecobank**

"Africa's requirement for logistics services and supply chain expertise is huge and growing every day. At the same time, many of the companies that need logistics to enter the market don't know how to get started in Africa or aren't willing to take the risk. The market is open for first movers who can navigate risk and nurture African talent. The opportunity is for those seeking to build long-term, sustainable businesses that bring world-class practices and adapt to local conditions."

**Geoffrey White, chief executive officer, Agility Africa**

"The need for faster, more affordable, more available data is driving the increasing deployment of fibre and high speed wireless in South Africa. This journey has been a long time coming, beginning with inter-continental connections and then moving on to local long haul city-to-city and metros. All of the megatrends of today, from connected cities, businesses and homes to mobility and the IoT, require high bandwidth availability and security, low latency and strict synchronisation. In Africa, we have a significant opportunity to leverage technological advances, as we do not have massive capital investment into legacy infrastructure."

**Eckart Zollner, business development manager, The Jasco Group**

"Mining has traditionally impacted heavily on land, both within the boundaries of the mining operation and in surrounding areas...there is a sustainable way to approach mining land rehabilitation which is cost and environment conscious."

**Robbie Louw, director, Promethium Carbon**

"With the move to an online world, businesses need to think about how they will adapt. This means that they need to become more agile, access data for improved decision-making and interact with stakeholders in a more personalised manner.

Magnus Nmonwu , regional director, Sage West Africa

In addition to thinking about how they will prepare for mobile customers, West African organisations also need to be ready for digital employees. Those that do the necessary groundwork will be in a strong position to attract, retain, and develop the best talent."

**Magnus Nmonwu, regional director, Sage West Africa**

"It is clear that those organisations whose culture is underpinned by strong values will create a workforce willing to engage with new safety processes and will therefore be best equipped to protect both their people and their assets. If these values have been socialised within the business and are used by leaders at all levels in an authentic manner then the safety culture in our industry will create the resilience it needs."

**Mark Walker, client partner, Optimus Seventh Generation**

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# African Review/On the Web

A selection of product innovations and recent service developments for African business. Full information can be found on *www.africanreview.com*

## CSP project established in South Africa

The Bokpoort Concentrated Solar Power (CSP) project, launched by a consortium led by ACWA Power, has been inaugurated in the Northern Cape Province of South Africa.

The US$325.1mn CSP project is expected produce enough power to supply more than 200,000 homes.

"The formal inauguration of the Bokpoort CSP plant is a significant milestone in supplying South Africa with reliable and cost competitive renewable electricity," said ACWA Power Chairman, Mohammad Abunayyan. "The success of the project demonstrates a robust partnership between the Government of South Africa, through the Department of Energy, and ACWA Power."

***www.africanreview.com/energy-a-power***

**The Bokpoort CSP plant is expected to supply reliable and cost competitive renewable electricity. (Photo: Xklaim, via Wikimedia Commons)**

## Daimler Trucks Asia starts producing Fuso vehicles in Kenya

Daimler Trucks Asia has begun production of its new Fuso range at the AVA assembly plant in Mombasa.

The process of adding the Fuso 2523C heavy-duty truck to the AVA assembly plant's portfolio took five months, with further models from the range to also be added.

***www.africanreview.com/transport-a-logistics***

## Boost for Nigeria's construction industry

A report from Timetric's Construction Intelligence Centre (CIC) has found that Nigeria's construction industry will continue to expand, with investment in infrastructure construction driving growth.

The outlook for the Nigerian construction industry is positive, the report said. The industry's output value is expected to rise at an annual average of more than nine per cent in the next five years, having posted annual growth close to 12 per cent over the past five years.

***www.africanreview.com/construction-a-mining***

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# Enabling access to agro-processing

## Johannesburg is set to become a regional food manufacturing and export hub, based around the networking opportunities at AB7 and SAITEX

In South Africa, the City of Johannesburg (CoJ) has launched an exciting and far-reaching strategy to establish itself as a food manufacturing and agro-processing hub. The City Authority will integrate its processing operations with the proven intra-Africa networking capabilities of two hugely successful Johannesburg-based exhibitions; Africa's Big Seven (AB7) and the Southern African International Trade Exhibition (SAITEX). The 2016 editions of AB7 and SAITEX take place from 19 to 21 June at Gallagher Convention Centre, Midrand.

"Africa's Big Seven has a stellar 14-year track record as the continent's biggest and most influential annual food and beverage exhibition," said show organiser Christine Davidson, vice president of dmg EMS Africa. "SAITEX has an even longer history as a mixed retail products expo for 22 years. SAITEX has become known as the biggest business opportunities event in Africa. Last year the two shows attracted over 860 exhibitors and almost 14,000 visitors from more than 70 countries."

**Supporting development initiatives**

The two co-located expos are a key driver for the City of Joburg's food and agro-processing strategy, which is a component of its Joburg 2040 Integrated Development Plan. Reginald Pholo, director of trade and investment promotion for the City of Joburg explained, "In order to facilitate access to markets, the City is focusing on infrastructure development that includes storage facilities, processing, cold storage and transport. So it's important to inculcate a culture of food processing, household and national food security and surplus sales to export markets, and AB7/SAITEX are the perfect platforms for this."

Emerging agricultural and agro-processing businesses are enjoying significant successes from projects and strategies driven by the City of Joburg – one of these is CoJ's ongoing participation in the AB7 and SAITEX shows. Pholo said, "CoJ uses these annual shows as part of its Exporter Awareness Programme, which showcases the many business opportunities for entrepreneurs. This also helps broaden South Africa's exporter base in the agricultural and agro-processing sectors by developing new and existing exporters."

**Success at SAITEX and AB7**

One resulting success story is David Osaro, managing director of Edo Fresh and the Nelson Mandela People's Market, who migrated to South Africa 24 years ago with virtually no capital, but a sheer determination to succeed. Osaro attributes a key reason for his success to SAITEX.

"Networking opportunities and interactions provided by CoJ are invaluable and have really changed my business," said Osaro. "My export produce now travels as far as Zambia, Nigeria, Thailand, Qatar and Japan; and the Nelson Mandela People's Market has grown from a team of just four people to now empowering almost 500."

Osaro also owns the logistics company Edofreight, which also carries multi-million-rand export orders secured at AB7 and SAITEX through the assistance of City of Joburg and the Joburg Market. Pholo said, "SAITEX is a phenomenal platform that should not be missed."

For the 2016 shows, the City of Joburg plans to host a series of export seminars as well as business-to-business matchmaking sessions in the International business lounge at Gallagher Convention Centre.

Davidson said, "With demand for quality packaged and prepared foods and beverages soaring throughout Africa's rising middle class markets, now is a good time to get a foot in the gateway to business in Africa, and that's AB7 and SAITEX." ■

SAITEX and AB7 attracted more than 800 exhibitors and nearly 14,000 visitors from over 70 countries in 2015

Reginald Pholo (centre) from City of Joburg visits the stand of one of his SMME exhibitors at SAITEX 2015

SAITEX is an effective networking platform for entrepreneurs seeking business opportunities in food manufacturing

Reginald Pholo (left) with one of the City's SMMEs at SAITEX 2015

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# Integrating Africa's assets into global value chains

## Improving the environment for integration into global trade, so increasing the continent's integration into global production networks

Leading international firms can be strategic partners for integrating into global value chains (GVCs). About four-fifths of world trade is linked to the networks of multinational corporations (MNCs). These firms – aided by modern transport and communication technology and increasing global division of labour are at the centre of the drive towards GVCs as they optimise their sourcing strategies through geographic re-organisation and the separation of production stages. Despite the surge in external trade in past 20 years, Africa still trades below its potential, both in terms of total flows and of positioning in GVCs, according to the International Monetary Fund.

The African continent so far captures only a modest share of global trade in value added terms, but higher level of GVC integration holds potential of boosting employment and diverting resources from less productive activities to newer ones, raising overall productivity – hence leading to much-needed structural transformation of the region. "African countries need to create 10-12 million new jobs every year just to absorb the young people entering the labour market .Governments can tackle this challenge by making a national priority of attracting foreign lead firm investments and integrating into global value chains", said the African Development Bank (AfDB).

The efficient functioning of GVCs requires combination of intermediate components from different locations and often many suppliers. The shortcomings in the business environment, infrastructure, productive capacity and skills in sub-Saharan Africa constitute major barriers to greater participation in GVCs. Therefore, any policy that seeks to encourage GVC investments should effectively address potential shortcomings, especially physical infrastructure and technical-managerial skills, the environment given to entrepreneurs, and effective openness to trade, including intraregional trade among Africa countries, which remains low compared to other regions.

**What determines GVC investment?**

Given the rising complexity and competition in global supply networks, MNCs selectively choose locations based on the presence of the following factors:

** Reliable infrastructure for supporting output facilities and handling exports*

The host country must provide efficient transport linkage both internal and external, utilities (power/water) and access to information, communications and technology (ICT). Improving transportation capacity – road, rail and air – enhances the links to ports and airports – hence enabling a faster delivery of goods and make African economies more attractive to foreign investors.

- *The requirements in terms of infrastructural services are often specific to the value chain*
  In agriculture, perishable goods (fresh fish, dairy products and flowers) require air freight and cold chain facilities, whereas coffee and cocoa demand efficient port facilities. In manufacturing, 'just-in-time' clothing/apparel orders require airfreight capacity, while automotive production necessitates port facilities. Manufacturing and assembly-line operations are attracted by the presence of cluster industrial parks and special economic zones where investors receive fiscal incentives.

- *Natural and human resources – the host country must possess the required raw materials for the manufacture of products and pool of skilled manpower*
  An educated workforce is crucial for export-oriented activities. "Investment in technical and vocational training programmes should complement investment in basic education to enhance specific skill-sets related to individual industries and value chains," advises AfDB. Unit labour costs and wages are, too, major considerations, where Africa still holds competitive advantage compared to south-east Asia and China.

- *Skill upgrades are prerequisite to shift into higher value-added activities in GVCs, such as processing and packaging*
  Delivering high-tech products requires setting up schools and training institutes specialised in the field as well as establishing testing laboratories. Most African manufacturers need technical and business administration courses to upgrade their productions and acquire better knowledge of global marketplace. Developing new varieties of products is a key element of successful strategies in many GVCs. The educational demands in labour-intensive services sector (mainly call centres and tourism) are much broader, from ICT skills – to foreign business languages (chiefly English and French).

- *Degree of industrialisation – manufacturers in host country should be capable of handling outsourcing businesses from overseas firms, sub-contracts works and producing components, with effective quality-control methods*
  In agriculture, many African smallholders are prevented from integrating into GVCs due to their inability to comply with international food standards and certifications, i.e. health/safety (phytosanitary) standards. Increased participation in GVCs also demands a more conducive business climate and the availability of entrepreneurs (capable of delivering supplies that meet lead firms' requirements for quality and timeliness).

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- *Greater openness to international trade measured by import barriers, quotas, average tariffs, etc*
  Trade liberalisation promotes new export sectors, with positive spillover effects on economic growth and job-creation. Policy barriers such as lengthy customs procedures undermine the competiveness of time-sensitive and perishable products. High tariffs on the import of intermediate goods and government stipulations to procure locally can also hamper the overall competitiveness of the value chain activity.

- *Further trade liberalisation measures can make African economies more competitive in international supply chains*
  For instance, reducing import barriers should help attract MNCs that rely on imported intermediate inputs and machinery to export manufactured goods. In particular, establishing faster import/export processes is vital to integrate the global supply networks that heavily rely on imports for assembling activities.

- *Investors place a higher premium on good governance and socio-economic stability in the host country*
  The wider business environment beyond infrastructure needs attention. Red tape, lengthy procedures and corruption serve to deter new investments by foreign lead firms, whilst preventing local entrepreneurs and farmers from making the most of the opportunities presented by GVCs. African port authorities need to eradicate inefficiency and capacity problems that result in long waiting times for export-oriented businesses. Improvements are essential to successfully compete in a globalised economy.

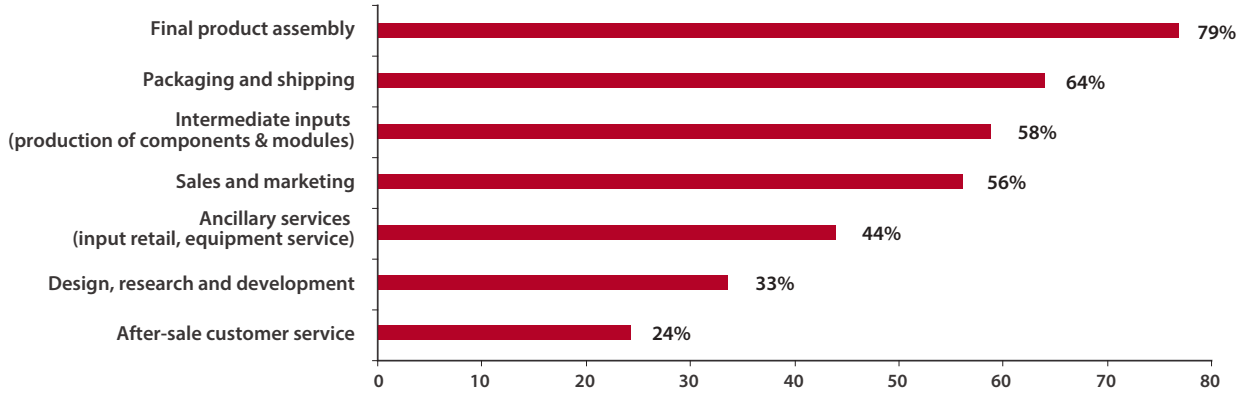
- *Effective collaboration requires support from local business associations*
  The Ethiopian textile and garment manufacturers association, for example, has become a vital partner for government and for global lead firms such as H&M (the Swedish clothing retailer). The association

**Table: Drivers of GVC Participation & Upgrading: Perceptions of Strengths & Obstacles**

| | Strength Percent* | Obstacles Percent* |
|---|---|---|
| Attractive endowments (e.g. natural resources and low-cost labour) | 38 | 18 |
| Openness to trade and foreign direct investment | 18 | 7 |
| Infrastructure and business environment | 38 | 63 |
| Domestic capacity to respond to external demand | 6 | 12 |

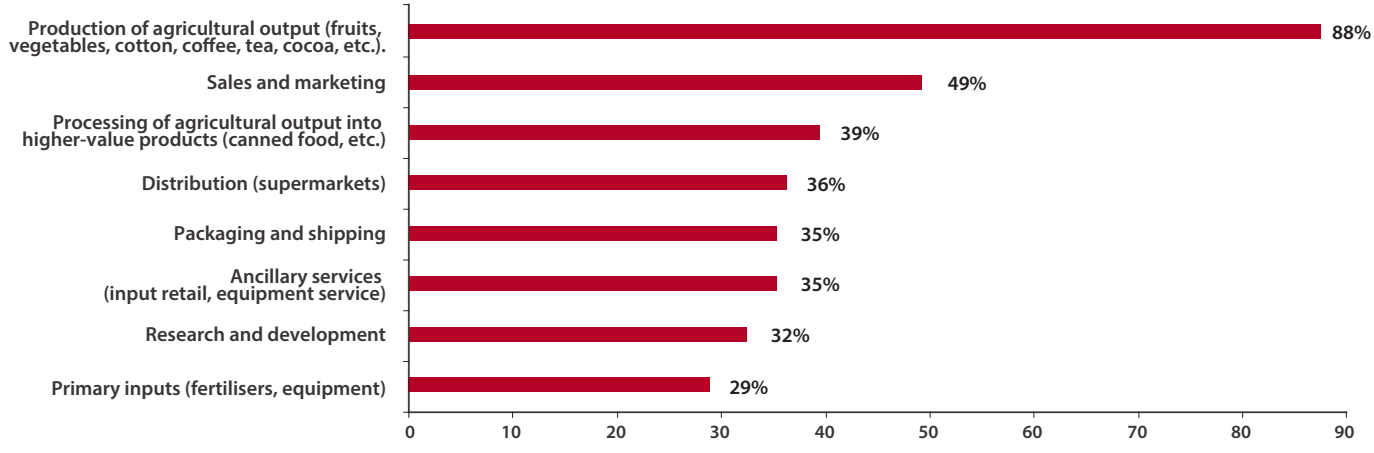
**Note: The percentages represent the share of total responses received for strengths and obstacles of operating in Africa, respectively.Source: African Development Bank, AEO Country Experts Survey 2014.*

**Chart 1: Global Manufacturing Value Chain Activities in Africa, 2014**




*Source: African Development Bank, AEO Country Experts Survey 2014.*

**Chart 2: Global Agricultural Value Chain Activities in Africa, 2014**




*Source: African Development Bank, AEO Country Experts Survey 2014.*

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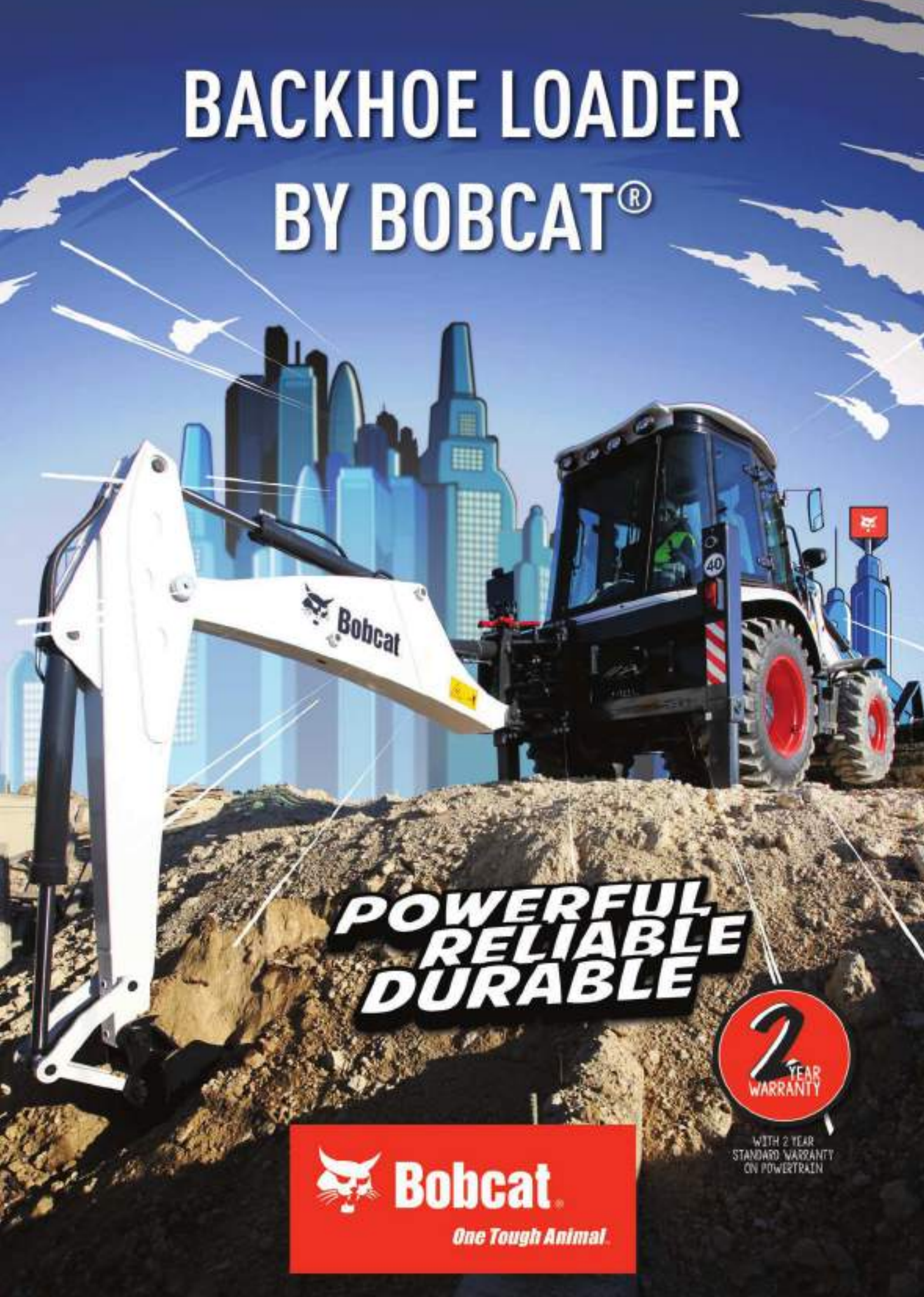

has helped to devise set of policies supporting the sector and been a partner to H&M in building-up capacity for meeting quality standards among local firms. The Kenyan Flower Council plays a similar role in Kenya's horticultural sector.

**Adding value**

Deeper ties into GVCs – a key determinant in adding 'enhanced value' to trade and building linkages with local firms – can help reduce African countries' unhealthy reliance on primary commodity exports, and thus vulnerability to exogenous external shocks. The region boasts an enormous potential to integrate into international production networks by leveraging its competitive advantages in agriculture, agro-business and manufacturing.

Having adequate infrastructure, especially reliable energy supply and significant transport logistics capacity, a supportive domestic business environment, skilled workers and capable firms and entrepreneurs, as well as lower tariff and nontariff barriers are deemed pivotal for integrating into and upgrading in GVCs – thereby attracting more lead global firms to Africa. ■

*Moin Siddiqi, economist*

## East Africa's powerhouse for intraregional trade & investment

HSBC Bank listed Ethiopia as one of the 26 economies projected to record the fastest growth between 2012 and 2050. It is a nation with tremendous untapped mineral wealth, fertile land, huge/young population (14th largest on earth), vast water resources and Africa's largest bovine population. The country's foreign policy of economic diplomacy plays a key role in promoting trade and investment from advanced and emerging/ developing economies in dam construction and hydropower plants, agro-based industries and light manufacturing, mineral extraction, railway/road construction and airport infrastructure, chemical and pharmaceuticals, as well as higher education and industrial training, hotel services, architectural and engineering works.

Ethiopia is in advantageous geographic position to access global value chains (GVCs) given transportation infrastructure and trade logistics improvements. UK-based frontier market investment firm Silk Invest said, "People are looking to improve their cost efficiencies, to live near their manufacturing base. It's a very stable place, a very welcoming place." "Ethiopia is closer to foreign direct investment than other parts of Africa," remarked Bruno Casella of the United Nations Conference on Trade & Development (UNCTAD).

Ethiopia's strong growth is largely due to shrewd national planning and ambitious development strategy to address structural problems by creating hard/soft infrastructures to facilitate job creation, by tapping into the country's comparative advantages in natural resources and trade, and by ensuring progress towards achieving the Sustainable Development Goals (SDGs). Thus, Africa's second most populous nation (after Nigeria) witnessed consistent double-digit broad based growth and poverty-reduction. "Ethiopia is often unfairly seen as emblematic of poverty and deprivation—but the progress it has seen over the past decade should help change that," said Ana Revenga, Senior Director for Poverty at the World Bank. She added: "If this progress continues over the next decade, Ethiopia can propel itself and most importantly, its people into a new era of prosperity."

Ethiopia has the largest public investments in Africa (and sixth in the world), relative to GDP. "In recent years, Ethiopia has made significant progress in infrastructure, and its infrastructure indicators compare relatively well with low-income country peers. The country developed Ethiopia Airlines (now one of the three main African airlines) and associated regional air transport hubs. It has launched an ambitious investment programme to upgrade its network of trunk roads and is establishing a modern funding mechanism for road maintenance. Access to water and sanitation is expanding rapidly (from a very low base) thanks to judicious concentration on intermediate options such as traditional latrines, wells, boreholes and stand posts," commented the World Bank.

Ethiopia's infrastructure ambitions are even greater. They include: a quintupling of power generation capacity; a major expansion of the trunk roads network; constructing a total of 2,395-km of rail network to increase connectivity both within national and cross borders; expanding nation-wide telecommunications service delivery; and further water supply expansion in rural areas. A public-private partnership (PPP) is being encouraged. Ethiopia needs to invest an average of US$5.1bn/year in infrastructure alone for an entire decade.

Most important transport projects are a new heavy-duty, high speed rail links to Djibouti (Ethiopia's main export-import corridor) and Lamu Port in Kenya. The Addis Ababa-Djibouti line – being constructed by China Civil Engineering Construction Corp; and China Railway Engineering Corp (costing US$1.2bn) will help foreign trade and reduce present high cost of international freight. Massive renewable energy investments are underway to reach power generating capacity of 10,000 megawatts (MW) over the medium-term. It will soon generate electricity from a new hydropower dam, the 1,879 MW capacity 'Gilgel Gibe III' on the Omo River and eventually 6,000 MW from 'Grand Ethiopian Renaissance Dam' under-construction on the Blue Nile River. The dam will be the largest hydropower plant in Africa and world's 11th largest upon completion by 2017.

A new five-year 'Growth and Transformation Plan 2' (2016-2020) places greater emphasis on improving the productivity and modernisation of the agricultural sector, and boosting the technological sophistication and economic input of the industrial sector. The World Bank believes Ethiopia could reach middle-income status by 2025 by raising domestic savings rates, private sector development and improving the trade logistics.

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# Creating a truly digital bank

Truly digital banking is more than digital facelifts to banking operations or channels. Infosys Finacle's Amit Dua, Vice President and Regional Head - Africa & Europe, offers perspective on creating a truly digital bank

IT systems, a bank's biggest enabler, has become the biggest barrier to innovation. From the days of product-centric banking, IT applications were architected to run processes for each product from end to end.

The problems were compounded with channel proliferation, which required the integration of channel-specific interfaces to product-centric architectures. Large banks in particular, have taken a big hit to agility, flexibility and innovation capability. This is not only preventing banks from performing to potential but also limiting them from exploiting the power of new digital technologies to the fullest.

As we head into 2016 and beyond, conventional banking institutions have other challenges, including the digital disruption and the accompanying threat of nimble, technology led fintechs, who are unbundling banking services. The only solution for banks is to simplify their IT landscape and evolve selective digitization initiatives into a holistic strategy that will turn the enterprise fully, truly digital.

The big question everyone asks is what makes a bank truly digital? At Infosys Finacle we believe that there is a lot more to a truly digital bank.

## The four hallmarks of a truly digital bank

Customers are no longer just passive consumers of financial services. Digitally empowered, they are taking control of their banking relationships and financial decisions, and expect that their banks will help them achieve their goals effectively and efficiently.

With customers becoming more demanding, assertive and influential in the relationship, banking experience is becoming the kingmaker in this business. Hence every aspect, including processes, strategies and decisions, must reflect this priority. Hence, when drawing up their business plans, banks should focus on customer value and experience as a primary goal, rather than an afterthought to cost and revenue targets.

Amit Dua-Vice President & Regional Head - Europe and Africa at Infosys

The truly digital bank will find ways to innovate regular products and processes to make them customer-centric. Fintech startup Digit and Commonwealth Bank exemplify this: Digit offers an app-less service that analyzes customers' spending based on which it withdraws small amounts to put into a fixed deposit. Incidentally, this type of product – a Flexi Fixed Deposit – has been offered by many of Finacle clients for several years now!

Commonwealth Bank has made the mortgage process more customer-centric with its property guide mobile app, which allows prospective home buyers to just "scan" a property and instantly receive data on ruling price, sales history, suburb profile, rental yield etc. This gives the bank an opportunity to engage with customers early on in the mortgage engagement cycle.

In a truly digital banking scenario, technologies like gamification and augmented reality will be leveraged to encourage desired behaviors and improve experience. Banks will look to collaborate and co-create to come up with the best, most customer-centric ideas. Importantly, banks will not only look at the needs of their own customers, but also their customers' customers.

In Poland, the ever innovative Idea Bank, the winner of BAI – Infosys Finacle Global Banking Innovation Awards 2015, is offering cash management services to SME clients that enable them to order a multi-function mobile ATM at no additional charge. A dedicated mobile app, developed in cooperation with iTaxi is behind this facility. Clients can call the nearest vehicle and monitor its position on a map with a real-time tracking system. Once it arrives, the customers can complete their cash management operations within minutes.

## Insight is everything

Banks always had a wealth of customer data, which has multiplied manifold in the digital era. The ability to quickly capture and convert data in near-or real-time into actionable insights will distinguish the digitally-enabled from the truly digital. With the help of advanced analytics technologies, banks

can now leverage the treasure trove of information, both within and outside the enterprise, to gain granular, real-time insights into customers, operations, markets and more.

Apart from transaction and behavioral data, banks also have access to a variety of external data sources from social channels that enable them to segment customers on the basis of individual values, expectations and needs, rather than by broad demographics. Using the power of analytics banks can now build richer insights into individual customers' life stage circumstances and personalize the banking experience to the 'segment of one'.

From the customer's perspective, this will manifest as more personalized, contextualized and relevant products and services. Truly digital banks will leverage insights to stay ahead and educate clients proactively about their emerging needs – even before the customer has fully recognized them.

Insights drawn from the advanced analytics will also be critical to reduce the cyber-risks and contain frauds. Truly digital banks will also leverage data-driven insights to optimize operations to reduce costs. For instance, banks can leverage the insights to optimally staff call center during the holiday season. Many of our clients are leveraging insights to decide upon the location for their ATMs. Digital banks will also leverage insights to identify opportunities for revenue expansion ahead of others. For instance, reaching out to unhappy customers of other banks with contextual offers.

To imbibe the full potential of analytics into the organization, truly digital banks would need to leverage cloud-based/ open source technologies. In addition, they must make efforts to democratize analytics and integrate it into the experience of all stakeholders, from customers and all types of staff – not just senior executives – to suppliers and partners.

### Automation drives experience

The rise of digital banking has created an explosion in transaction volumes. For a truly digital bank, automation is a critical prerequisite both for delivering a frictionless experience at the customer interface and streamlined operations at the back-end. Automation, driven by business rules, algorithms and machine learning, will give banks the operational leverage to process millions of transactions and thousands of loans every day without increasing costs. It will also allow them to accelerate the pace at which they acquire new customers and expand their business. Automation will also free up the workforce from mundane repetitive tasks to allow them to focus on higher value generating activities.

But that's only the beginning. The truly digital bank has to exist in a world of autonomous businesses driven by the Internet of Everything and smart machines, which has several implications. When refrigerators and kitchen containers order groceries on their own, banks must have a way of engaging with those gadgets. Even more importantly, they must prepare to engage and influence intelligent machines like Avatars, Robo-advisors and Automated Investment Platforms that will help clients take decisions in future.

> **"Truly digital banking will not be around monolithic universal banks, but around a banking ecosystem of best-in-class banking expereince providers."**

With more data, more compute and better algorithms driving smart automation on the one hand, and emerging technologies like Blockchain pointing at the automation of clearing, settlement and reconciliation on the other, the truly digital bank will need to create the necessary capabilities to help it sustain in its fully digital environment.

### Collaborative ecosystem is the new universal bank

The digital paradigm distributes, decentralizes and disintermediates. Hence truly digital banking will be built not on individual universal banks, but on an ecosystem of providers who will together deliver best-in-class experiences. The focus, therefore, will have to be on building systems of collaboration that can create a constantly expanding ecosystem that can deliver all services relevant to a customer's financial needs in a seamless manner. The ecosystem will be the new universal bank in the digital era. Accordingly, the ecosystem needs to include partners from the financial and non-financial industries.

Such an ecosystem will give banks the ability to create interfaces with other auxiliary networks and services that can enable them to extend the reach of their core business functionality as well as quickly add new competencies. Banks will become more open, thanks to APIs, apps and developer/partner ecosystems.

### Renew and New: The Infosys Finacle's recommended path to truly digital banking

The dual strategy of 'Renew and New' is built on the bedrock of unified purpose, innovation and creativity. The strategy calls for banks to upgrade and deploy moderns systems that allow them to tap into the benefits of new technologies such as mobility, analytics, cloud computing, block chain, and artificial intelligence to gain agility to respond effectively to the evolving environment. At the same time, banks also need to leverage these new technologies to open green-field opportunities for growth, profitability and enhancing consumer experience.

Balance is key to the Renew and New strategy. While banking leaders everywhere are eager to add new digital capabilities that will open up new opportunities, they have to also ensure their existing systems, processes and applications are capable of absorbing and supporting such capabilities. A linear approach, which prioritizes one over the other, will fail to deliver to expectations. The emphasis, therefore, has to be on an orchestrated strategy that drives renewal from the core outward even as it enables the effective assimilation of new digital technologies from the edge. Focusing entirely on adding digital capabilities at the customer interface without connecting them back to the core would create a short-term tactical advantage at best. On the other hand, reengineering the core without adequately re-imagining processes and digitalizing customer-facing systems will severely impede innovation in the enterprise. At Infosys Finacle, we have successfully applied this dual strategy to banks of diverse sizes, in different stages of technological evolution, and with distinctive priorities. ■

# Telecoms and transactions

## Ghana's financial services are set for further standardisation of the mobile money market

Having realised the huge volume of cash transactions handled by the country's four out of six telecom service providers - MTN, Tigo, Airtel and Vodafone - through their mobile money services, ARB Apex Bank, which is run by Bank of Ghana (BoG), has moved in to set guidelines for their operations.

According to Apex Bank, the number of mobile money transactions grew from 30m in 2012 to 106m by December 2014. The values were GH¢171mn (US$43.48mn) in 2012, GH¢2.4bn in 2013 and GH¢11.6bn in 2014. MTN premiered mobile money services in 2009, initially offering services such as money transfer and airtime top-up, and now has 4.8mn registered customers, 19,500 merchants handling 18.5mn transactions.

**New ways of working**

With the new guidelines, both the number and value of transactions are set to multiply as analysts believe they will facilitate the expansion of financial services to millions of unbanked citizens and help capture financial transactions within the informal sector.

One of the major differences between the old and new guidelines is that mobile operators will require a license to become dedicated e-money issuers (DEMIs). They will own and manage the electronic money business using retail outlets and agents, extend coverage of their services and be supervised by the BoG.

The 'E-money Issuers Guidelines' and 'Agent Guidelines' is therefore meant to create an enabling regulatory environment for convenient, efficient and safe non-cash retail payments and transfer of funds.

The new guidelines, developed with key stakeholders including the Ghana Chamber of Telecommunications (mobile operators), the banks, payment service providers and other prospective electronic money issuers gave the telcos engaged in the mobile money service up to six months to establish a separate business entity to handle these services.

The guidelines, which became effective in July 2015, stipulate, "Non-banks that have previously been offering mobile financial services in partnership with banks must apply within six months of the coming into effect of these guidelines, for a license in order to conform to the new framework."

An objective for these guidelines, according to the central bank, is to "ensure that electronic money is only provided by (a) financial institutions regulated under the Banking Act, 2004 (Act 673); or (b) duly licenced non-bank entities which are engaged solely in the business of e-money and activities related or incidental to the business of e-money, and which are regulated and supervised by the Bank of Ghana."

The e-money issuers, the central bank said, promote the availability and acceptance of electronic money as a retail payment medium with the potential to increase financial inclusion, and specify necessary safeguards and controls to mitigate the risks associated with e-money business and ensure consumer protection.

The guidelines further categorised customer e-money accounts into various groups which define their maximum daily and monthly transactions and also stipulated an aggregate limit on cash-out and outbound payments.

However, the transaction limits can be amended where applicable as the bank itself pointed that, "For very large companies where even these limits would be overly restrictive, an approval to supersede these limits may be granted...on a case by case basis upon receipt of application from the EMI justifying the need, proposing a revised set of limits, and providing business information supporting the proposal," the guidelines stipulate.

The central bank however cautioned that, if approved, EMIs are strictly obliged to ensure the revised limits for each merchant are continuously adhered to. "If the Bank of Ghana perceives that this privilege is being abused, it will prescribe rectifying action for the EMI and may ultimately revoke the privilege," the central bank warned.

**Clarity amongst the competition**

According to the chief executive officer of the Ghana Chamber of Telecommunications, Mr Kwaku Sakyi-Addo, one consequence of these guidelines is that mobile money services would receive a major boost in the near future from integration and interoperability of the various mobile money platforms, allowing transactions between networks.

Speaking at a dialogue on mobile financial services he said in the wake of the issuance of the guidelines for mobile financial services, and in light of the promise shown by the sector, the industry would consider making this feature available in the future.

"In the last few years, in the absence of clear guidelines from the central bank and considering that mobile financial services were just taking off, the mobile operators were essentially focusing on growing their customer base but now that there is a bit more clarity with the e-money issuer and agent guidelines, I think that we are going to see in the coming months and years, this bottleneck addressed," the CEO said.

There are currently four players in the sector - MTN, Tigo, Airtel and Vodafone. The service in Ghana however lags behind countries like Rwanda, Uganda, Tanzania, and Kenya due to the lack of interoperability and other challenges. However, Peter Zetterli, a financial sector specialist at the Consultative Group to Assist the Poor (CGAP), who is the country lead for Ghana on financial inclusion, believes that forcing interoperability too early could stifle the sector because telecom companies will have no incentive to make the investments necessary to lay the foundation, and the mobile financial services sector would be better served allowing telecom companies the freedom to invest and reap the benefits as they do. ■

*Kafui Gale-Zoyiku*

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# CWG's live services hub

In its attempt to become Africa's number one IT platform service provider, CWG Plc has launched a mobile financial services platform in partnership with CIT Vericash.

The hub which is resident in CWG Plc's data centre in Lagos, will allow the company provide banks and telcos across Africa with a platform that will enable them deliver improved mobile financial services to both banked and unbanked population.

Speaking on the essence of the innovation, Mr James Agada, chief executive officer at CWG Plc, explained that the CWG Vericash Hub is designed to enable financial institutions offer quality services to their customers at a reduced cost.

Mr Agada said, "Any bank, telco or mobile money operator can take advantage of the CWG Vericash Hub to launch advanced mobile financial services without making extensive investment in hardware or software. The hub supports various deployment models - white labelling, co-branding and even onsite deployment. As we speak, it powers the U-mobile, a trail blazing mobile banking product recently launched by the United Bank for Africa."

He further highlighted the unique features of the hub, saying, "CWG Vericash Hub supports wallet services, agency services, integration with payment cards (credit, debit, prepaid), bill payment, shopping services via mobile channels App, SMS and USSD. It also features a sophisticated transaction processing engine that is able to orchestrate transaction flow between multiple service providers, a feature that will enable banks to offer a large number of non-traditional services from insurance to ticketing.

"In addition to these, the CWG Hub also benefits by being connected to the Vericash Network bringing additional cross border services in remittances and bill payment."

This innovation comes on the heels of a number of so many other widely acclaimed solutions that has positioned the company as a leading provider of technology solutions that enable business growth in Africa. Recall that she powers the Diamond Yello Account to provide access to Diamond bank services to millions of MTN subscribers in Nigeria, using their mobile phones.

CWG has also launched http:\\openmall.ng, an ecommerce platform that allows SMEs own their own virtual stores online and improve their sales. Another is http:\\smerp.ng, an accounting and business management solution that aims at empowering SMEs keep accurate records and generate important data. ■

# A forum for future flight

## The 4th Africa Airport Expansion Summit brought together individuals in the aviation sector to network and discuss the future of this industry

African airports are very important for many international airlines due to their high profit and stable growth. Growing affluence across Africa has definitely generated greater demand for air travel. By 2034, eight of the ten fastest growing aviation markets are expected to be in Africa, while nearly 300mn passengers will travel to and from African destinations. Much of this growth is anticipated in routes within the African continent.

However, this outstanding expected growth in passenger and cargo will put a pressure on the airport infrastructure to adapt. The implementation of new airport
technology is required in the air and on ground to improve runways, taxiways and other parts of the airport to enhance safety, efficiency and sustainability in aircraft movement and operations. To be successful, any airport must be able to cover multiple facilities and technological advancements. Consequently, it is important to choose right the first time, whether it is taxiways, terminals, ATC or IT solutions, security or simply passenger conveniences, such as passenger seats and trolleys.

**Strengthening systems**

Pascal Komla, president of Airports Council International, ACI Africa took the audience through the airport development in Africa, key trends, current outlook and future plans for the region.

Klaus Lauth of GauffConsultants presented approaches for airport expansions with special view on Jet Blast and Collision Avoidance issues followed by Thomas Varughese of Cellcomm on how facilitations of passenger traffic can be achieved by strengthening communication systems and enhancing security.

Klaus Lauth of GauffConsultants presented approaches for airport expansions with special view on Jet Blast and Collision Avoidance issues followed by Thomas Varugheseof Cellcommon how facilitations of passenger traffic can be achieved by strengthening communication systems and enhancing security.

Flora Wakolo, chief ATC at Kenyan CAA offered insights into how ATM technologies can support safe and efficient expansion of airports and in same time benefit ATC through the plan developed by ICAO for a global Aviation System Block Upgrade (ASBU), which would improve Airport Operations through Airport CDM. ASBU initiative is intended to constitute the framework for a worldwide agenda towards ATM system modernisation under the concept of One Sky. The airports will benefit from increased capacity and better stand and gate utilisation and ATC will benefit from a decreased workload due to reduced traffic holding in the terminal area. ■

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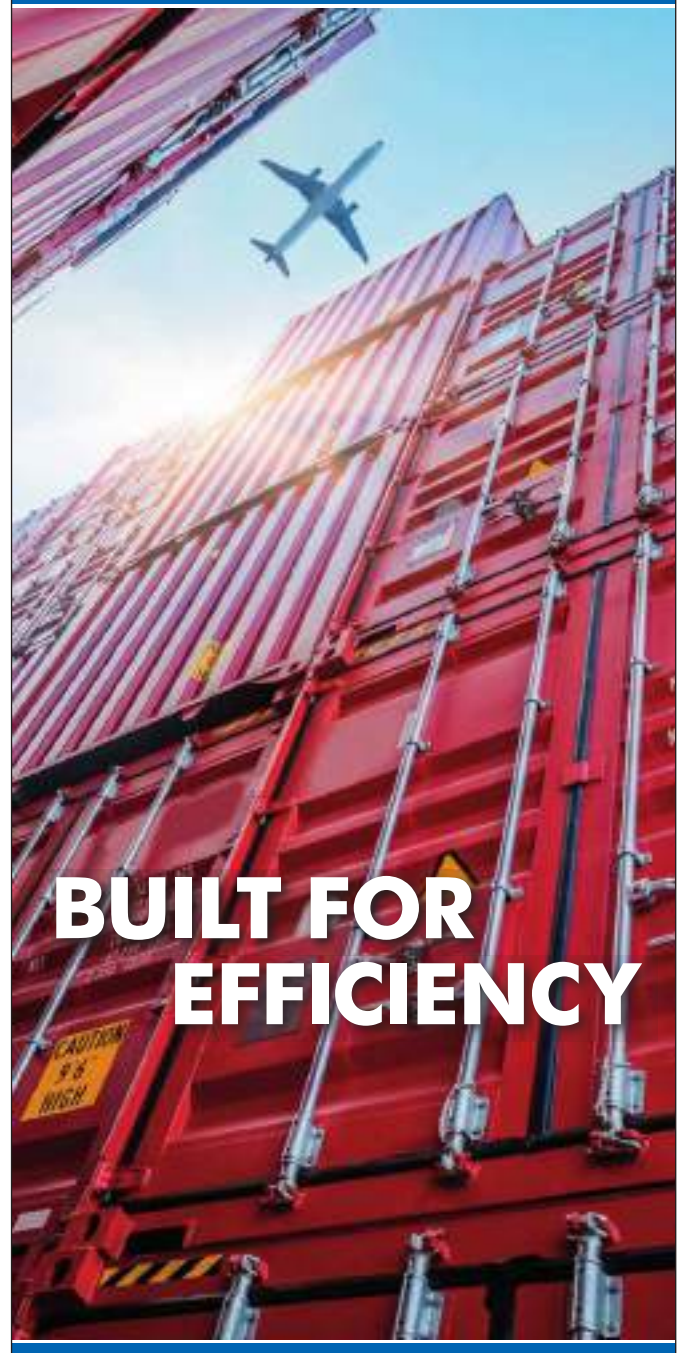


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# Campaigning to crash less

## Partnership of automotive companies created Global NCAP aims for an accident-free future

More than 1.3mn people are killed globally in road crashes every year. This is being addressed by agencies and countries around the world, which are targeting the most important risk factors like speeding and drink driving, as well as focusing on crash avoidance through technologies which can stop crashes happening at all.

Created by Global NCAP, the #STOPTHECRASH partnership is addressing crash avoidance and car safety and urging both manufacturers and governments to uphold standard regulations. The need is for key crash avoidance technology to be in all newly manufactured and sold vehicles, which would go a long way to cutting global road deaths. The safety technologies prioritised by #STOPTHECRASH for mandatory inclusion are:

- Electronic Stability Control (ESC).
- Autonomous Emergency Braking (AEB).
- Anti-Lock Brakes (ABS) for Motorcycles.

Consumers International (CI), Global NCAP and #STOPTHECRASH partners including Bosch are calling on UN Member States, especially those with significant vehicle production to mandate ESC in all new models by 2018 and in all vehicles in production by the end of the UN Decade of Action for Road Safety in 2020. ESC is widely considered to be the most important vehicle safety development since the seat belt. Seventeen case studies between 2001 and 2007 have shown ESC to be highly effective in avoiding single vehicle crashes by approximately 30 per cent. In the European Union, where ESC became a mandatory requirement in all new cars from November 2014, it is estimated that since 1995 at least 188,500 crashes involving injury have been avoided and more than 6,100 lives saved. In the United States of America, where ESC became mandatory from 2012, it's estimated that over 6,000 lives have been saved by this technology.

Amanda Long, director general of Consumers International, said, "We are very excited to join the #STOPTHECRASH partnership with Global NCAP. The partnership's advocacy campaign focuses on three essential crash avoidance technologies which are available, proven and inexpensive to equip. There is no reason for these technologies not to be fitted as standard by car manufacturers."

> **"Best practice countries demonstrate the importance of a clear approach to road safety."**
>
> **- Mme Dipuo Peters, MP, Minister of Transport, Republic of South Africa**

Bosch has been working for many years on the vision of accident- and injury-free driving. It has already achieved considerable success since it launched the ESP electronic stability programme in 1995, which has prevented 190,000 accidents and saved more than 6,000 lives across Europe.

"After the seat belt, ESP is the most important vehicle safety system – even more important than the airbag," said Dr Dirk Hoheisel, member of the Bosch board of management. If all vehicles were equipped with the anti-skid system, up to 80 per cent of all skidding accidents could be prevented. Bosch has manufactured more than 150mn ESP systems since 1995.

**Safer roads in South Africa**

The pressing need for improved efforts towards road safety were articulated recently by Honourable Minister of Transport Mme Dipuo Peters, MP, who said, "It is an undeniable fact that South Africa has a serious challenge with regard to road safety. As a country, we reported a road death rate of 23.5 per 100,000 people in 2014 when the global average is 17.4 fatalities per 100,000 people. Middle income countries like ours record an average of 18.4 fatalities per 100,000 people.

"The importance of road safety to the economy and society at large provides a convincing case for decisive policies and strategies to address the problem. People injured or killed on our roads are often breadwinners in their families and important contributors to the economy at large."

#STOPTHECRASH Partnership, led by Global NCAP, includes not only Consumers International and Bosch, but also ADAC, Autoliv, Continental, Denso, Thatcham, ZF-TRW, and the Toward Zero Foundation. Continental in particular is developing and testing new materials and technologies on the tyre front, and bringing products to market with higher levels of safety performance, particularly in braking.

One of Continental's key safety concepts, ContiGuard is set to play a major role in the realisation of accident-free driving. It integrates all of the car's active and passive safety systems with vehicular and surrounding sensors.

"Tyres are the sole point of contact between the vehicle and the road. All forces transmitted to the road are put down via a footprint no bigger than the size of a postcard. In a critical situation, it is the tyre that determines whether the vehicle can stop in time, or whether it stays safely on course through a corner," said Nikolai Setzer, member of the executive board of Continental AG and president of the company's tyre division. "This is why we want to inform as many drivers as possible, all over the world, about the safety benefits of using high-tech tyres inflated to the correct pressure and with adequate tread depth." ■

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# Ramping up marine research at ABB

## The high technology facility developing the next generation of maritime technology with ship owners

Power and automation group ABB has been strengthening its commitment to research and development in the marine sector at its new laboratory. Situated in Helsinki, Finland, next to the factory making ABB's Azipod gearless steerable propulsion systems, it brings together all ABB's offerings for the shipping industry under one roof. ABB has invested significant funds in the scheme, which is being used by the 30 ABB engineers dedicated to marine research as well as to demonstrate products to customers.

ABB has been working to develop and enhance process control systems, communications solutions, sensors and software for the IoTSP

**A step forward**

"We are constantly testing and developing new technologies. This laboratory is a wonderful step forward and enables a full range of innovation activities, now that all of our marine systems can be tested and developed in the same place," said Mikko Lepistö, vice president of software and automation operations at ABB, at the opening of the facility in October 2015.

The Helsinki lab supports the pillars of ABB's marine technologies including automation, remote control systems, propulsion, integrated operations and waste heat recovery systems. In the future, it will also have the possibility to function as a simulator.

IoTSP enables machines to be operated more safely, with greater efficiency, and with lower environmental impact

> **"When data collected by automation systems is utilised in the most optimal way, we can save both costs and environment. The Internet of Things, Services and People opens new possibilities for the marine industry."**
>
> **- Mikko Lepistö, ABB**

IoTSP generates new revenue opportunities through innovative business models

## Meeting customer needs

The laboratory is designed to meet the needs of the customer. Heikki Soljama, managing director of ABB's marine and ports business unit, said, "R&D is as important as ever for the shipping industry. The challenges facing the whole sector are well documented and now is the time for innovation and new solutions; this lab will help us achieve that goal. Ultimately, though, we will be responding to the needs of the industry and the desire for cost efficiency, reliability and safety will always be key."

The lab utilises ABB's Integrated Operations concept, which joins up the shore operation to what happens onboard, an outcome of ABB's commitment to the 'Internet of Things, Services and People' (IoTSP).

"Digitalisation allows owners to monitor remotely entire fleets using cloud services. When data collected by automation systems is utilized in the most optimal way, we can save both costs and environment. The Internet of Things, Services and People opens new possibilities for the marine industry and especially for the development of the service business," Lepistö said.

## Internet of Things, Services and People

ABB has been advancing technologies for the 'Internet of Things, Services and People' for more than a decade via its control systems, communication solutions, sensors and software. Its technologies allow industry, utility and infrastructure customers to make more intelligent use of data to optimise their operations, increase productivity and achieve greater flexibility. Ongoing work at the Helsinki lab extends the offering of ABB in this field. ■


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# The tech to transform supply chains

## Collaborative robotics technology is on the verge of large-scale relevance for logistics

Deutsche Post DHL Group (DPDHL Group), the world's leading mail and logistics company, is approaching a point in time where robots are going to become essential in the world of logistics. The Group has launched a new Trend Report "Robotics in Logistics" revealing how collaborative robots will affect supply chains. Robotics technology may soon be picking, packing and moving goods in the logistics environment.

Matthias Heutger, senior vice president strategy, marketing & innovation, DHL Customer Solutions & Innovation, said, "Robots work in many industries but haven't made an impact on logistics yet because of the complexity of the work – handling a wide array of different things in an infinite number of combinations, close to people and in confined spaces. Current research shows that 80 percent of logistics facilities today are still manual. Recently, however, technology is just starting to catch up to meet demands for flexible and low-cost robots that could collaboratively work in logistics."

**Robots in warehouses around the world**

The report highlights that the development of the next generation of robots that can see, move, react to their environment and work at precision tasks alongside people, is on a fast track powered by the explosion in labor-intensive e-commerce and diminishing and ageing workforces.

As a result, investment from government, venture capitalists and large retailers in several countries is driving a new wave of research that is having significant impact on creating robots with logistics affinity. In addition to the US, China, Russia and Japan, Europe is firmly in the robotics race. With the European Commission's SPARC programme, the EU will invest €700mn (US$) into robotics research, and a consortium of 180 European companies has pledged an additional €2.1bn by the year 2020.

Clemens Beckmann, executive vice president innovation, Post - eCommerce - Parcel, Deutsche Post DHL Group, said, "Just like our children can't picture a world without computers, it is likely that their children will

feel the same way about robots. Developing the next generation of robots that can work around and among people will take a substantial investment to advance the technology but at DPDHL Group we believe that soon supply chains will see humans and robots working side by side to handle goods faster and more economically."

**Prototype testing**

DPDHL Group has already started testing how robotics could further play a role in logistics. The Group trials collaborative robots in selected warehouse sites to find solutions for transforming supply chains. The speed of technological progress is increasing rapidly with new advancements and breakthroughs occurring almost daily. The outlook for robotics is very exciting and the world of logistics will benefit from the coming developments in robotic technology.

The Trend Report "Robotics in Logistics" includes insights and updates from leading academics and practitioners from the fields of advanced robotics, and has been created as part of the overarching Logistics Trend Radar, which DHL uses to identify and leverage trends and technologies relevant for the logistics industry. ■

# LogiMAT awards best warehouse products

An intelligent order picker that interacts and keeps pace with the operator, adapting intuitively to his/her working rhythm so that he/she can concentrate fully on picking; a software solution that enables intermodal 360° transport monitoring; and an ingenious system that enables easy standardised collection and processing of article master data – these are the innovative products and solutions that have won Best Product Awards at LogiMAT 2016, the international trade fair for distribution, materials handling and information flow.

Three companies received prizes for their innovative products in the 'Best Product Awards" category.

In the category 'Order picking, Conveying, Lifting, Storage technology' the winner is STILL GmbH for the order-picker STILL iGo neo CX20. Like an automatic teamworker, this intelligent order picker interacts with the operator, keeping pace with him/her as s/he moves around, but keeping a safe distance. This innovative vehicle is like a second shadow that adapts intuitively to the operator´s working rhythm. Because the picker always gives way to the operator, the operator can move around the picker freely as s/he works.

In the category 'Software, Communication, IT' the winner is Synfioo GmbH for its product, Synfioo 360° Transportation Monitoring. For trouble-free processes in transportation companies, logistics as the interface to the outside world is of immense importance.

In the category "Identification, Packaging and Loading technology, Load securing" the prize went to SICK Vertriebs-GmbH for its Master Analyzer. Industry 4.0 uses and changes article master data, these are the key to flexible automation. The increasing individualisation of the products demands constant expansion and amendment of master data. They have to fulfil certain requirements such as flexibility and adaptability, so that processes can be managed in an efficient and resource-saving way. ■


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# Making the most of warehouse space

## With Stodec Trading equipment, a company does not necessarily have to construct a new building to increase capacity

Mezzanine warehousing for a mining company in Mauritania

The cost of providing safe, secure and operationally effective warehouse facilities continues to increase. Most companies will need their products, component parts, raw materials and essential production spare parts to be accessible and available exactly when required, in first class condition and in the quantity needed.

Deciding how large the warehouse should be, how the material is stored and how the stock or components are recorded, controlled and accessed is absolutely essential to the success of the companies' operations so that Logistics and Warehouse Management is now recognised as a key part of any enterprise.

**Improving storage and stock control**

There are many types of goods handling and storage equipment now available which can be installed to increase capacity, or improve access, or assist with stock control and security and new systems are being developed to meet differing market conditions all the time.

Stodec Trading Ltd have been designing and installing storage equipment and facilities for more than 30 years and its Dexion equipment has been used throughout Africa for over 60 years so itsexperience of warehousing in Africa is very extensive.

In many warehouse facilities, the most useful storage equipment is standard adjustable pallet racking and sometimes extra benefits can be achieved by designing these components into new racking designs such as Drive-In racks, Push back, Shuttle carriers, Double deep storage, Narrow Aisle, Mobile racking, Cantilever racks and other variations which will meet the particular needs for the product or location.

**Cost-effective mezzanine floors**

Mezzanine floors are now becoming a frequent component of new facilities and they are particularly a very cost-effective and efficient way to add valuable additional floor area into an existing warehouse area where unused headroom is available.

Stodex mezzanine floors are supplied from the UK in ready to install kit form and, with the company's on-site supervisor giving training and guiding a local installation team, they can be erected with limited disruption to existing operations.

Stodex mezzanines are designed to meet the highest structural standards and meet fully British and European Standards. Generally they can be installed on existing good quality warehouse concrete floors and this allows valuable overhead space to be used for storage or office space without costly new buildings or extensions.

Stodec Trading Ltd can design the mezzanine floor to meet the loading requirements of your particular site, with upright spacings, loading gates, stairways and the type of flooring being selected for each application.

A mezzanine floor installation should always be considered before an expensive new building is undertaken so that existing premises are being used to the full.

Shelving, racking, mesh security fencing or office partitioning can all be combined with the installation so that the footprint of the mezzanine is fully utilised.

Mezzanine floors have been installed by Stodec on many sites in Africa including Angola, Mauritania, Ghana, Cote d'Ivoire, Nigeria, Ethiopia and currently in Namibia.

If your warehouse area has headroom space that is not being used, or if you need more floor space but existing stock or shelving is spread out, then consider a mezzanine before you look at a more expensive option.

Stodec Trading Ltd site www.stodec.co.uk has useful data on mezzanines as well as the many alternative storage systems. A detailed brochure in the download section shows mezzanines in use. ■

# Material management

Even though Ghana doees not have enough modern sewerage systems to carry away waste water and human excreta from houses and other buildings, the few that the country has, are frequently choked with all sorts of waste by human activities with impunity. Throughout Ghana, this negative attitude of secret disposals of waste materials is common: packaging human excreta in black polythene bags and throwing them into open gutters; on streets; in front of people's residences etc. by many unscrupulous people can best be described as a major problem and disincentive to those who continuously exhibit the spirit of volunteerism by cleaning their surroundings.

There are also people who litter anywhere they find themselves during the day with all kinds of rubbish ranging from plastic containers, bottles, leather, aluminium products etc., even though at certain vantage points, there are public rubbish bins available to dump them in. About 85 per cent of all solid waste dredged from Ghana's choked gutters is made up of plastic, water sachets, polythene bags among others.

**Appropriate responses to rubbish**

From July to November 2015, Ghana's Minister of Environment, Innovation Science and Technology, Mahama Ayariga placed a ban on light plastic materials with less than 20 microns (one millionth of a metre in terms of density). He said at the time the ban's introduction, "Nobody can manufacture plastic products of below 20 microns."

The Mayor of Accra, Alfred Oko Vanderpuije said in 2013 that government was working to secure funding from its development partners for the construction of a modern drainage system in Accra, but up to now, the antiquated sewerage systems continue to beg to be modernised or have them reconstructed.

An environmental economist, Kofi Owusu Bempah has gone on record in the state-owned 'Daily Graphic' that strenuous attempts to solve the perennial flooding in Accra would come to naught if the deficiency in the construction of the Odaw drains was not solved completely. In Accra, Caprice acts as the confluence of the Odaw and Onyasia streams, and anytime it rains heavily, the Odaw drain quickly gets flooded because its size is too small to contain the volume of water, hence the overflows. According to Kofi Owusu Bempah, "If the volume of the force of the water are twice as much but the gutter size is not twice as much, at a certain level this will cause a spill. That is what we are experiencing now." ■

*Emmanuel Yartey*

# Dealing with the demand for water

## Why improved pump monitoring technology can make the difference in the continent's water distribution

The failure in December 2015 by so many sub-Saharan countries to meet their access to improved drinking water millennium development goals illustrates the need for a radical reappraisal of the approach hitherto adopted by the continent's main actors to the supply of fresh water. In 2016 the widespread adoption of a number of new technologies could transform this endeavour. The technologies range from the simple hydraulic ram pump and 'elephant pump' to the relatively more sophisticated 'smart pumps' that have recently been trialled in a number of rural locations.

**Cheap and easy**

Hydraulic ram pumps are based on a tried and tested technology. They rely on the energy of a large amount of water falling from a small height to lift that water to a much greater height. In this way, water from a spring or stream in a valley can be pumped to a village or irrigation scheme on the hillside. Its advantage includes the fact that ram pumps are inexpensive; simple to construct and install; do not consume petrol, diesel or electricity; require only minimum maintenance; are pollution free; and can perform, quietly, 24 hours per day.

In Africa, the technology is now making headway. In January 2016, the New Zealand engineer Kevin Smith, owner and founder of Kevin Smith Steelworks Ltd, commenced installing New Zealand made Williamson HiFlo ram pumps in the east African country. This followed a visit to New Zealand last year from Dr Cleophas Lagat, governor of Nandi County, Kenya. By early February, a total of six pumps were in the process of being installed as part of a pilot project that will service around 6000 people each.

**Smarter solutions**

Solar power is also making its presence felt in Africa's water sector. The non-profit organisation Water Wells for Africa (WWFA) recently developed a solar-powered pump to replace the hand pump. The advantage, claims the WWFA, is that they are easy to maintain. According to the WWFA, "Sophisticated pump systems are best suited for areas where people are living in condensed quarters. The demand for water in 1 sq km in a town can be 10 times greater than 1 sq km in a rural area."

But perhaps the biggest breakthrough in Africa's water distribution is being made in the area of 'smart monitoring' and 'machine-to-machine' technology. This technology, also known as machine-2-machine (M2M), is helping with flow and pump monitoring and the reduction of water wastage. When installed in dams and reservoirs M2M's ability to rapidly detect leaks enables the relevant authorities to be notified before water levels are dangerously low.

At the local level, monitoring - through the use of 'smart' phone technology - is now being incorporated into water pumps in order to benefit rural communities across Africa. As part of its pilot project Mobile Water for Development, a team from Oxford University placed data transmitters inside the pumps in 66 drought afflicted villages in Kenya. If the pump breaks down, a text is instantly sent to a repair team. The year-long project, which concluded last year, is said to have greatly transformed the lives of the participating villagers.

Remote sensing technology features highly in the US-based non-profit organisation's 'The Water Project'. This project is set up to provide reliable water supplies to communities in sub-Saharan Africa. Beginning in first quarter 2016, a number of remote sensor initiatives are scheduled to get underway as part of this project. These include: the Kapkoimur Secondary School New Well Project; the Kimanget Well Rehabilitation Project; the Machemo Well Rehabilitation Project; and the Makhwabuyu Well Rehabilitation Project. These are all being provided with borehole wells and hand pumps, with remote sensors attached. The projects include implementation, monitoring technology, training maintenance teams, and the setting aside of five years of repair funding to ensure reliable, ongoing safe water. Once installed, monitoring data from the sensors will be uploaded to show daily functionality and when teams make repairs.

**Security of supply**

Well monitoring can also play a vital role in terms of security of water supply infrastructure. In South Africa's Tswaing local municipal area the townships have been plagued by water insecurity causing the nation's Department of Water and Sanitation to provide urgent relief to the area.

Vandalism and theft of boreholes and pump stations are being blamed for the poor quality water supply. Security is now being upgraded and the department is equipping and rehabilitating selected boreholes, as well as drilling additional boreholes in order to augment water supply.

Meanwhile, Xylem Water Solutions South Africa Godwin Field Smart Technology (FST) recently introduced innovative technology allowing customers to monitor pump operation anywhere in the world, via cellular or satellite communication.

"Information about an engine's and pump's operating conditions – running temperature, oil level and pump suction and discharge pressures for example - can all be relayed via this telemetry system," explains Dave Boucher, product manager at Xylem Inc. Godwin FST features a built-in alarm system that warns operators of faults within pumps.

Although this technology is being rolled out for South Africa's mining sector it does appear to hold out a promise for the eventual transformation of Africa's water and sanitation industries. ■

*Nnamdi Anyadike*

# Water security in forests

The water security of eight out of ten people in the world is under threat. Forests have an important role in providing and regulating water at the local and regional levels in a number of ways, from groundwater recharge and erosion control to promoting precipitation through evapotranspiration.

Forested watersheds and wetlands provide about 75 per cent of the planet's freshwater resources, while over one third of the world's largest urban centres depend on protected forests for a significant proportion of their water. It is estimated that every US$1 spent on sustainable forest watershed management can save US$7.5 to US$200 in water treatment costs.

A new programme launched by the Food and Agriculture Organisation (FAO) aims to enhance the critical role of forests in improving water quality and water supplies. The programme, focused on the relationship between forests and water, looks at ways to improve water security in eight West African countries: Gambia, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Sierra-Leone. The FAO works with communities to raise awareness of the interactions between forests and water, help integrate forest management in agricultural practices to improve water supplies.

"The challenges are many, but the goal is very clear: to ensure the sustainable management of forest and water resources on the planet," said FAO Director-General Jose Graziano da Silva. "Promoting forest restoration and avoiding forest loss will require a significantly increased level of funding and innovative financing."

**Focus on improved monitoring**

Initially, the programme focuses on setting up a forest-water monitoring framework to help countries assess potential forest benefits in terms of water resources. This involves developing a set of standardised monitoring indicators and field methods to identify which forest management interventions result in improved water quality and enhanced supplies. This data will be in turn used to develop better-informed practices and policies to unleash the full potential of forests in improving water supply.

The monitoring framework is piloted in West Africa's Fouta Djallon Highlands, with field activities having kicked off this month. The project, funded by the Global Environmental Facility, is being jointly implemented by FAO, the United Nations Environment Programme (UNEP) and the African Union (AU).

"The role of forests for water is becoming even more important in the face of climate change, with increased incidences of extreme climate events such as flooding and drought, and increased water insecurity," said FAO Assistant Director General of Forestry, René Castro. ■

# Exploring ocean potentials at OGAF

## The 2016 Oil & Gas Africa expo forms an effective services showcase and business networking platform for industry professionals

OGAF is one of five exhibitions that comprise the Cape Industries Showcase (CIS), an industrial expo which attracts many operators, stakeholders, supplies and service providers exploring new opportunities. The event will take place at CIS from 13 – 15 July at the Cape Town International Convention Centre.

The Oil & Gas Africa and Maritime and Offshore Marine Africa expo enables buyers to meet face-to-face with training organisations to discuss their training needs.

Africa faces a major challenge to meet the growing demand for skilled technicians in both the African maritime and oil and gas industries. These sectors offer unlimited career opportunities for an eager younger generation with the requisite skills acquired by incentivised training through relevant SETAs.

**Spotlight on industrial investors**

Industry-focused training will be in the spotlight at this year's Cape Industries Showcase (CIS), a five-in-one industrial expo which incorporates the well-known exhibitions Oil & Gas Africa and Marine Africa. These exhibitions provide the ideal platform to bring together the relevant industry role-players and associated training institutions to address the skill deficit.

CIS organiser Exhibition Management Services' John Thomson said, "In order to help alleviate the technical skills shortages in the oil, gas and maritime industries, we are offering education and training institutions at a substantial discount on exhibition stands at this year's event.

"The focus on training at CIS will provide a useful networking platform for employers, government, training organisations and other stakeholders to promote training and skills development, and recruit candidates for training in the maritime and oil and gas industries."

The government's planned investment of ZAR9.2bn (approx. US$5.97mn) to develop Saldanha Bay into a world-class hub for southern African offshore oil and gas drilling will create substantial opportunities for companies operating in the sector. The Oil & Gas Africa (OGAF) 2016 expo forms an effective services showcase and business networking platform for this rapidly expanding industry.

**Focus on the business**

The Saldanha Bay Industrial Development Zone (SBIDZ) is the first major step in the government's 'Operation Phakisa' initiative to expand and develop South Africa's ocean economy potential. This is South Africa's first dedicated facility aimed at providing support services for upstream E&P developments in South, East and West African coastal oil and gas fields.

Thomson said, "Its main functions will focus on ship and rig repairs and maintenance, exploration, production and logistics support and marine/sub-sea engineering and fabrication."

**The Saldanha Bay Industrial Development Zone is part of the government's plan to develop South Africa's ocean economy potential.**

The SBIDZ is creating a rapidly growing number of business opportunities for the broad marine and maritime sectors as South Africa accelerates its own offshore oil and gas exploration. In the past four years, almost all offshore exploration blocks are under licence or under application for exploration by independent companies.

The training focus of this years' Oil & Gas Africa and Maritime & Offshore Marine Africa exhibitions is gaining considerable support from a number of education and training organisations which have already booked exhibition stands.

The Cape Industries Showcase (CIS) combines the Maritime & Offshore Marine Africa Expo, the Oil & Gas Africa Expo, the Cape Logistics expo, the Temperature Controlled Storage and Distribution Expo and the Empowertec Cape SME Expo in one co-located event. ■

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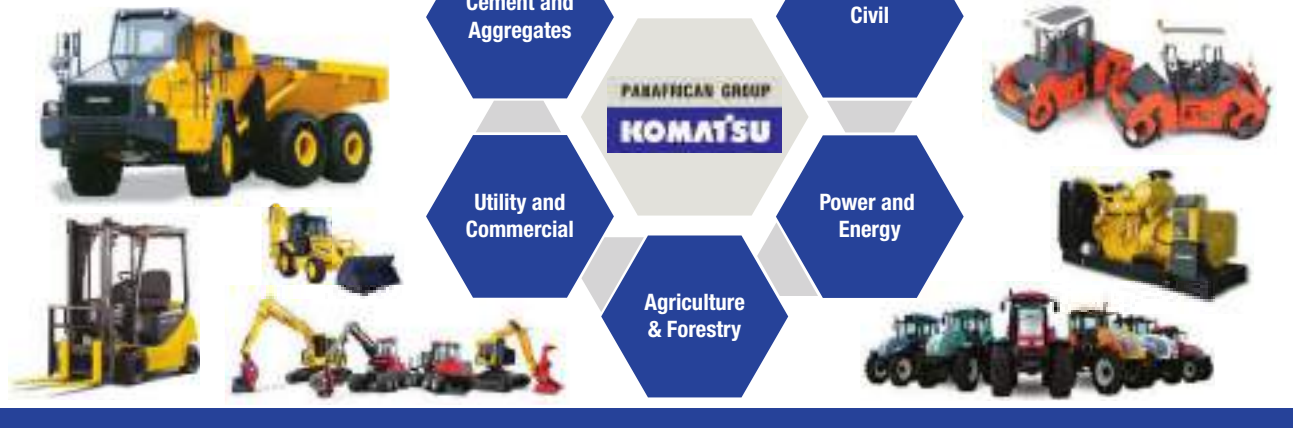


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# Growing West African gas distribution

## Pétro Ivoire director-general Sebastien Kadio-Morokro discusses the various challenges to petrol and gas distribution in Côte d'Ivoire

Sebastien Kadio-Morokro, the director-general of Pétro Ivoire, describes his company's operations as having two major components; offering a gas bottle distribution for domestic and industrial consumers and petrol for the retail petrol stations that they operate across the country.

Sebastien Kadio-Moroko is the son of the founder Mathieu Kadio-Moroko, who established the company in 1994. Kadio-Moroko senior is now the chairman of the company, leaving the day-to-day management to his son.

"Our objective is growth," Sebastien Kadio-Morokro said. "To increase our network in terms of filling stations and to stay at the top of the distributor networks here. So we are working on improving our gas and petrol distribution."

**Doubling distribution**

In fact, Kadio-Morokro aims to double the size of the company with five years.

Speaking specifically of LPG gas, the managing director says that there are one million branded Pétro Ivoire gas bottles in circulation, and the company refills, on average, about 15,000 of the 6kg and 12kg bottles a day.

Various logistics companies, on behalf of Pétro Ivoire, handle the physical distribution, but although margins are higher, and the gas trade is hugely important, it is petrol that is the biggest contributor to the company's bottom line in terms of revenues.

Asked what have been the company's main challenges since his father established operations, Kadio-Morokro says that firstly the hurdle was to establish their network, and then to organise efficient distribution. That was no easy proposition as the multinationals had a stranglehold on the sector.

And like many of the indigenous companies that African Review spoke to, the issue of finding investment was a serious constraint. Raising capital seems to be a common problem for all Ivorian companies.

Sebastien Kadio-Morokro, director-general, Pétro Ivoire

As one businessman explained recently, "There are no investment banks, nor private equity funds in Côte d'Ivoire – all the financial institutions are ultra-risk averse. Yes, I can borrow CFA10mn from a bank, but they will ask for a collateral of CFA40mn-CFA50mn! Raising capital is a big problem for Ivorian enterprises."

But Kadio-Morokro seemed reasonably bullish on this matter because, by leveraging his company's excellent track record over the years. He confirmed, "We have got all kinds of financing firms and funds to develop our activities".

Distribution is Pétro Ivoire's core activity, but they are already eyeing other revenue streams to expand the business into other areas.

"We need to establish our core distribution activities and finalise investments in the next two or three years, but our vision is to build regional networks in both Francophone and Anglophone West African countries," he explained.

**Revenue streams**

In many parts of the world, the retailing of fuel is becoming secondary to the other offerings found at filling stations. For example, following a deal that the giant French energy company Total made with Wari in Senegal, making any Total filling station effectively a Wari agent for the purpose of offering remittances, Total found that it was earning more revenues from Wari than from its petrol sales.

When asked about the situation in Côte d'Ivoire, Kadio-Morokro said it was a similar case and Pétro Ivoire has identified providing boutique shops and other services, such as car wash facilities as potentially "interesting revenue streams".

Since Pétro Ivoire began fuel distribution activities in Côte d'Ivoire, others have seen the company's success and attempted to replicate their business model. But Pétro Ivoire was the first private Ivorian company to distribute gas and petrol.

Was there an advantage to being seen as a pioneering, indigenous company? Kadio-Morokro was dubious that his company could really take advantage of this fact, and instead insisted on the importance of being a company that offers the same level of services and products that its main rivals, the major multinationals, provide to their customers.

He reassured this writer that these multinationals play fair in the ultra-competitive downstream oil and gas sector thanks to the government's stringent regulatory environment. But Kadio-Morokro did add the rider that smaller companies are not always so diligent in always respecting the local rules.

Kadio-Morokro also says that Pétro Ivoire is scrupulous in ensuring all the companies that it works with, for example the road transport operators that are contracted to move the petrol and gas bottles around the network, strictly adhere to the rules and regulations. ■

*Stephen Williams*

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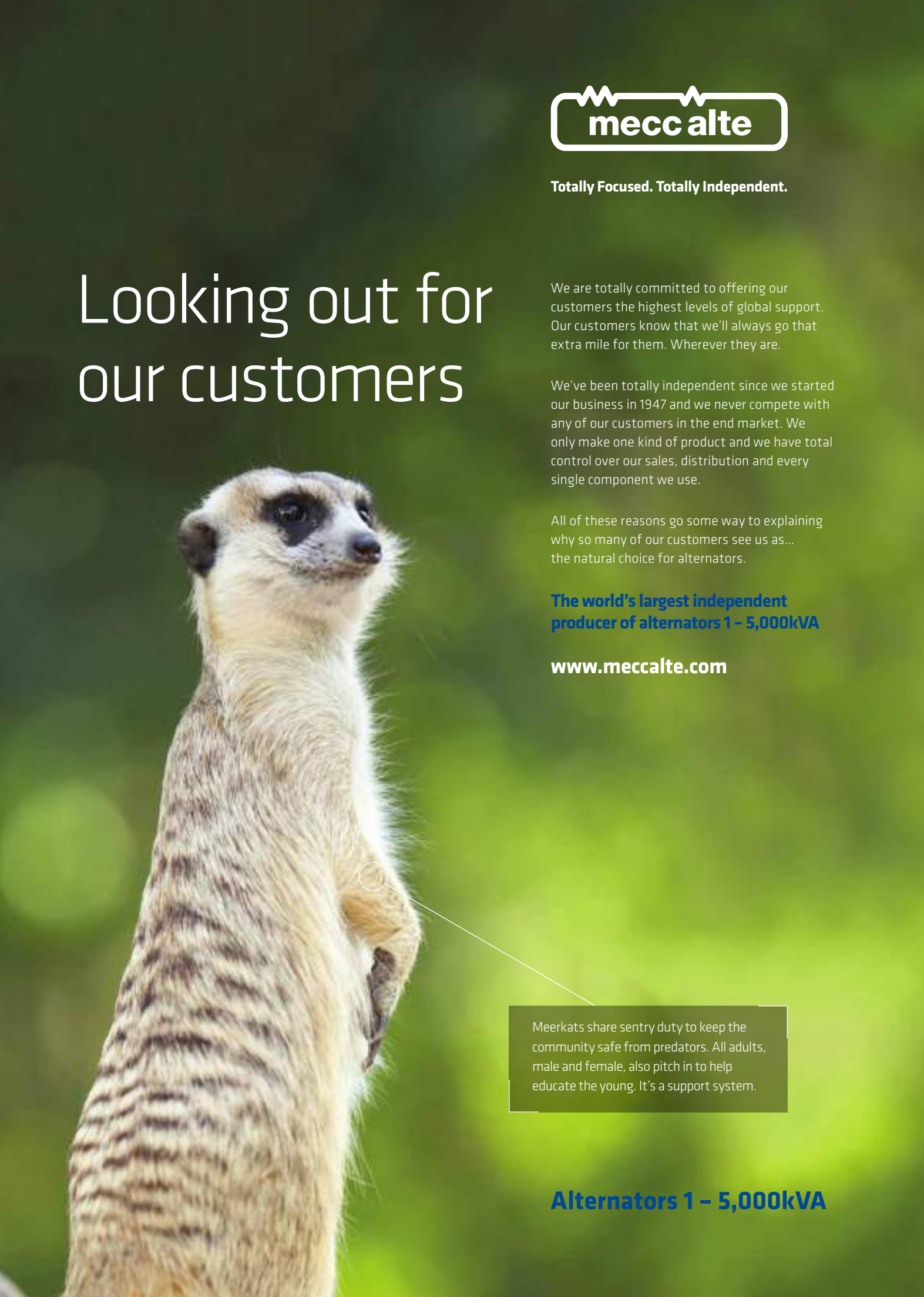

Meerkats share sentry duty to keep the community safe from predators. All adults, male and female, also pitch in to help educate the young. It's a support system.

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# Improving analytics to increase efficiency

## Advances in big data technologies and services can help reduce electricity consumption

Syed Mansoor Ahmad, vice president and global business head, EcoEnergy, Wipro Ltd

The world we live in has become increasingly digital and connected, and we now have the ability to collect data from many new sources. Sophisticated sensor technology has given rise to the Internet of Things (IoT) and machine-to-machine (M2M) communication, embedding intelligence, integrating more data sources than ever and providing the potential for informed decision-making based on comprehensive insight. However, as a greater proportion of our world is driven by electricity, and populations continue to increase, we are seeing a year-on-year increase in the demand for energy. In some countries, including South Africa, the result has been a gap between supply and demand. The only way to reduce demand and bridge this gap is to improve energy efficiency. Harnessing the power of big data analytics, organisations can become empowered not only to reduce energy consumption, but to leverage wider supply-side optimisation, including demand management, energy procurement, and tariff-based savings. This not only helps to improve energy efficiency, it also reduces energy costs, and helps organisations to meet carbon emission reduction targets.

**The structure of control**

Energy may be one of the largest operational expenses of many organisations, but it is also highly controllable. However, organisations without a structured means of managing energy consumption frequently end up compromising on operational policies. The impact of this is that it can negatively affect the organisation's sales and brand image. Compromising on policies results in lower productivity of staff, a decrease in the equipment performance and lifespan and a reduction in the quality of the goods sold.

Aside from the pressing need to optimise energy consumption in order to reduce electricity cost and demand, one of the biggest challenges organisations around the world currently face is to achieve sustainability targets, as well as profitability and customer acquisition targets. Often, enterprises are also tasked with achieving this in a massively distributed infrastructure environment, which may include large office buildings, warehouses, and even water treatment plants. Achieving energy efficiency in such scenarios is exceptionally challenging. The IoT, M2M communication and the availability of big data and analytics can offer the solution. Organisations in possession of data around their infrastructure are able to generate greater awareness of their operations, and the analysis of this data can assist in delivering actionable insight for improvement and optimisation. Energy management, utilising interconnected infrastructure and big data analytics, is essential.

**Mentoring and managing**

Energy management involves monitoring and managing all energy consuming assets in a single location or across various locations, with a view to optimising consumption and improving performance and asset lifespan. Energy management ensures that assets are run as and when they are needed, reducing the running time of equipment, which results in reduced wear and tear, ultimately extending the lifespan of assets. This is all achieved without compromising on service or product quality. In addition, by running assets at the optimum set points and as per the specifications given by the manufacturers, organisations can also optimise the performance of various assets. By managing and reducing energy costs, organisations can also free up budget for other areas that can add value to the business, including improving the customer experience, which in turn is key to driving increased sales.

Energy management requirements are often unique to a customer, market or environment, because of variables such as climate conditions, equipment that needs to be run and more. Energy management practices must therefore be tailored to each individual organisation. However, in order to achieve this, it is essential to have sufficient data available to aid in the decision-making process around how operations, services, locations and energy consumption can be optimised. This frequently proves to be a further challenge, as the availability of data is limited in buildings utilising legacy building management systems. In addition, many organisations do not have data collection mechanisms in place, primarily because they do not have a clearly defined objective making this necessary. It is only now that organisations are realising the value of data when it comes to making decisions in all areas, including energy efficiency, which they have begun to work toward tracking data and deriving insight from it.

Not only will the availability and analysis of big data around energy usage assist organisations to optimise their consumption, it can also provide significant insight to utility providers themselves. Energy consumption data and the analysis of this data will help providers to plan better. In addition, utilities can use the data to drive programmes and incentives that encourage users to adopt more energy efficient devices, which in turn will reduce overall demand. By reducing the overall demand, the utilities will be better able to provide adequate supply. This will help bridge the growing demand-supply gap. leveraging big data. ■

*Syed Mansoor Ahmad, vice president and global business head, EcoEnergy, Wipro Ltd*

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# Why genset markets will continue to grow

## As experts expect increasing business in diesel generators, African Review offers a guide to viable application

According to research published by MarketsandMarkets, the global market for diesel generator sets is expected to grow from an estimated US$13.06bn in 2015 to US$16.96bn by 2020, increasing at a compound annual growth rate (CAGR) of 5.4 per cent from 2015 to 2020. The growth will be driven by a consistently increasing requirement for continuous power supply and increasing power outages.

New research suggests the global market for diesel generator sets is set to grow

**Reasons for running generators**

Continuous and prime power generators act as the main source of power. These will operate continuously or for extended periods of time. There are differences between the two products, however. The main distinction is that continuous power generators operate continually with a consistent load, whereas prime generators can be operated for long durations at variable load.

Standby or emergency generators, however, run only in backup situations, when there is a power outage on the main utility grid or the main source of power.

Continuous and prime generators are typically used in remote locations where there is no access to the grid to supply electric power in applications such as mining, oil and gas operations, or construction. They are also used when there is limited electric power from the grid.

The need for standby or emergency power arises when there is a temporary disruption in the primary power supply. Like any other machinery running continuously for long hours, continuous or prime generators need to be robust enough to handle the heavy power loads supported by them.

**Keeping a set cool**

Typically, prime generators features a large cooling system. Continuous fuel combustion creates enormous amounts of heat, which must be removed by artificial means in order to prevent temperature build-up. Often, cooling will managed with a circulating cooling water in a jacket around the engine, whereby circulating water absorbs heat from the engine and is then cooled by a radiator fitted with a fan. A system will also cool the engine lubricating oil. Larger, industrial generators (above 2,250kW) will feature a cooling tower or some other elaborate cooling systems.

Standby generators do not require the elaborate features found in continuous power diesel generators. Since standby power generators are operated for relatively short periods, they can cool naturally when not in operation. Moreover, maintenance on standby sets can be undertaken without disrupting the power supply. Standby power generators do not heat up as much as prime generators do, so these power units also require smaller cooling systems.

**Power variables**

In the majority of cases, continuously operated generators provide 25-100 per cent of the rated capacity for an unlimited amount of time. Moreover, these units provide only constant output at the rated capacity. For applications in which loads will be entirely dependent on power supply from diesel generators, it is wise to install identical duty and standby generators. Operators will connect these, so that one unit can start automatically if another unit fails to function.

The key difference with standby generators is that they offer varying outputs for specific time periods. Such generator sets will be connected with an automatic transfer switch (ATS), in order to start automatically when there is an outage from the main electrical supply.

**Reasons for buying**

There is significant value in having a generator available for use when power is unavailable or limited. Whether the generator is merely a backup power supply or a constantly working piece of equipment, the impact on domestic and commercial situations can be transformative. Many in key growth markets such as Nigeria rely on a generator to provide electricity to power the tools they use daily in their trade or profession. ■

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# Networking for new Nigerian power generation

Nigeria's leading power forum, the Nigeria Power Conference & Exhibition (www.nigeria-power.com) is set to take place 13-16 June in Abuja. The event comprises two key platforms for knowledge-sharng and networking - a Strategic Conference at the Nicon Luxury Hotel on 13 June, and the Oil, Gas & Power Exhibition held at the International Conference Centre from 13-16 June.

Providing attendees with an unrivalled networking opportunity across the oil, gas and power sector, the Nigeria Power Forum is the meeting place to network with the senior decision makers, remain ahead of the competition and be the first mover in this new power landscape.

Many important and distinguished decision-makers are expected to speak at the event, within a comprehensive array of industry leaders, including:

HE Babatunde Fashola, Minister of Power, Works & Housing, Federal Republic of Nigeria

HE Mustapha Baba Shehuri, Minister of State for Power, Works & Housing, Federal Republic of Nigeria

Dr Anthony Akah, Acting Chairman, Nigerian Electricity Regulatory Commission (NERC)

Adeoye Fadeyibi, Managing Director/CEO, Transcorp Power Ltd

Rumundaka Wonodi, Managing Director & CEO, The Nigerian Bulk Electricity Trading PIC (NBET)

Matthias Onweazuka Obiaya, CEO, Association of Nigerian Electricity Distributors (ANED)

Engr Matthew Edevbie, Managing Director, 4Power Consortium

Walid Sheta, Country President, Schneider Electric, Anglophone West Africa

**Influential backers**

Nigeria Power brings together the entire value chain to discuss and debate the critical issues facing the Nigerian industry post-privatisation. With official endorsement by the Federal Ministry of Power, those attending the event will be the first to hear from the new influencers on the latest developments in this fast-evolving industry.

Part of Nigeria Oil & Gas (NOG) Week, the largest oil, gas & power gathering in Africa, Nigeria Power provides a unique opportunity to meet the who's who of the entire industry under one roof.

The event is supported not only by the nation's Federal Ministry of Power, but also by Nigerian Bulk Electricity Trading, the Presidential Taskforce on Power, and the Nigerian Electricity Regulatory Commission. Event sponsors include Schneider Electric, JMG, and Levmore Services.

## Africa - a continent on the brink of massive power generation capacity

Historically dubbed the "dark" continent, electricity uptake in Africa remains low, where currently the annual average consumption for all of Sub-Saharan Africa is only 518 KWh* and across the continent only 10 per cent of individuals have access to electricity – generally reaching the wealthy, urban middle classes and commercial sectors. This however is set to change.

Power and electricity are intrinsically linked with, and a crucial element to, successful growth and development in economies. Over the last decade or so, many African economies have been undergoing seasons of rapid transformation – which is largely spurred by demand from emerging and developed economies, alike, for natural resources. However, with this rapid growth and development, the power requirements of these growing economies has expanded and there continues to be a driving need for more widespread, reliable and sustainable electricity.

The future of energy in Africa looks promising, as there is huge potential for building new power generation capacities, where we are already seeing a number of capabilities and projects coming to fruition. With this, the reality is that coal baseload will still be a dominant solution for power especially in sub-Saharan Africa, as it is still the most cost effective in terms of the availability of fuel resources to generate electrical power. In addition to coal baseload, while this may differ per region, we can expect that Africa's future energy mix will be made up of gas-to-power and nuclear baseload power, as well as greener or renewable solutions such as solar, wind, hydropower, wave energy, and bio-energy.

Cooling tower at nuclear power plant (Photo: SNW/Shutterstock)

*Jay Urban, director power generation, WSP/ Parsons Brinckerhoff Africa*

# CrossBoundary Energy's investment pioneers

## Sustainable power stakeholders succesfully raise US$8mn of equity to bring solar solutions to African businesses

Investment firm CrossBoundary Energy has recently completed the first close of CrossBoundary Energy Fund I, Africa's first dedicated fund for Commercial & Industrial solar. Through 2016 and 2017, the fund will deploy over US$25mn to build solar facilities to power African enterprises through the SolarAfrica platform.

Due to a dramatic fall in cost, solar is now a viable alternative energy source for businesses in Africa. But it needs finance to be attractive.

Across Africa, economic growth is stifled by expensive and unreliable electricity. This challenge represents an immense opportunity for investment. Matt Tilleard, co-managing partner of CrossBoundary, observed, "Africa is undergoing an energy revolution and has become a laboratory for pioneering new methods of energy delivery. A key driver of this has been the dramatic fall in cost of solar power – down by over 80 per cent since 2008. Solar is now often cheaper than the grid in a majority of African countries."

Jake Cusack, co-Managing Partner at CrossBoundary, noted, "For many of the businesses that drive Africa's growth, solar power is now an alternative source of cheaper and cleaner energy. However adoption remains low due to two barriers. First, solar has a substantial upfront cost. Without financing, solar installers are typically only able to offer upfront purchase of the solar system. This means that the customer has to pay the full cost of 25 years of electricity on the first day. Second, many customers are unfamiliar with solar and reluctant to take responsibility for the technical and operational details of the system."

Mr Tilleard said, "In markets such as the US, both these barriers were removed through the introduction of financed solar solutions. Instead of paying upfront, the financier builds the solar asset and the customer enters into a long-term power purchase agreement (PPA). With today's announcement, we are bringing the same financed solar solutions to Africa. Financing is now available to make cheaper, cleaner energy a reality for African enterprise."

The installation at the Garden City Mall in Nairobi is the largest solar carport system in Africa

**Empowering project developers through the SolarAfrica platform**

CrossBoundary Energy will deploy its investment capital through SolarAfrica, a platform that provides solar installers a fully financed 'PPA in a box' to offer customers. SolarAfrica brings together CrossBoundary Energy's financing with technical oversight and asset management services from NVI Energy. Through SolarAfrica, CrossBoundary Energy allows solar installers to offer PPAs to African firms – enabling them to pay for the solar assets over time, just as they would pay for grid electricity.

Mr Tilleard said, 'SolarAfrica already has a strong network of partners and we are actively looking for new developers who are interested in offering a financed solar solution to their potential customers. We welcome interest from developers across Africa. We are currently in operation in Kenya and are hoping to expand to up to three additional countries in the next three to six months. Our funding is available for solar projects above 200 kWp that serve commercial and industrial customers.'

Mr Cusack commented, "The fund is a unique and innovative financing platform that will pioneer an entire new asset class in Africa. It is backed by a prestigious group of investors from the USA and Australia attracted both by the commercial returns and the opportunity for positive environmental and economic impact."

Investors include Blue Haven Initiative, TreeHouse Investments and Ceniarth.

**Critical support for affordable energy**

Power Africa has been a crucial supporter of CrossBoundary Energy. Through Power Africa, the Overseas Private Investment Corporation (OPIC) provided an early-stage grant to support establishment costs and the United States Agency for International Development (USAID) provided a US$1.3mn first-loss contribution to the fund. Mr Tilleard noted that this "was a groundbreaking innovation by USAID that helped attract private investors to this opportunity".

In addition, the Shell Foundation, an independent charity, has also provided grant funding and business support to accelerate CrossBoundary's expansion into markets outside of Kenya and lay the groundwork for follow-on funds.

> **"Electricity is a fundamental necessity for economic growth in Africa. Yet across the continent, electricity remains expensive and unreliable. According to estimates by McKinsey, almost 600 million people remain without electricity; approximately 70% of the population."**

The transaction was led by Chadbourne & Parke LLP with local counsel support from the Africa Legal Network and Viva Africa. Ikenna Emehelu, a partner at Chadbourne said, "We helped solar companies create a market for distributed energy in the USA. We have seen that mass-market adoption of renewable energy occurs not when technology becomes available, but when it becomes affordable. By pooling institutional capital to finance upfront installation costs of solar systems, CrossBoundary has made solar affordable for the malls, hotels, schools and small businesses it serves in Africa. Chadbourne congratulates the CrossBoundary team whose tenacity and vision has unlocked a promising new market in Africa."

At fund close, CrossBoundary Energy also announced that its first major investment is an 858 kWp solar installation at the Garden City Mall in Nairobi, Kenya. Mr Tilleard announced, "It is the largest rooftop solar system in East Africa and the largest solar carport system in Africa. It is also the largest solar PPA that we are aware of with a private consumer in Sub-Saharan Africa. This is an exciting first step on CrossBoundary Energy and SolarAfrica's mission to introduce solar-as-service to African enterprises."

**Opportunities in clean infrastructure**

Providing clean energy for African businesses represents a major commercial and environmental opportunity. The development of innovative energy financing and business models in Africa means the continent could have smarter, cleaner and more decentralised electricity infrastructure than developed countries. Mr Cusack noted, "Through the first dedicated fund for Commercial & Industrial solar, CrossBoundary Energy hopes to help Africa take a clean path to development through a transition to improved infrastructure and increased economic productivity with minimised environmental impact." ■

The solar panelled carport at Garden City Mall in Nairobi

# Clarke Energy bags first GE order in Cameroon

## SCTB is set to save more than US$200,000 in annual fuel costs by switching to GE's natural gas unit

GE's Distributed Power business has confirmed that Clarke Energy, GE's new authorised distributor of Jenbacher gas engines in Cameroon, is supplying a 1.4MW J420 Jenbacher gas engine to Flour Mill SCTB (Societe Camerounaise de Transformation du Blé) to provide more reliable, cost-effective, on-site power for the company's mills in the city of Douala. The project marks the first Jenbacher gas engine order in Cameroon for Clarke Energy.

The Jenbacher unit will permanently replace existing rented gas generators at the site, giving SCTB a more cost-effective, permanent, on-site power solution that will enable the company to save more than US$200,000 annually in fuel costs. The system is scheduled to enter commercial service in the second quarter of 2016.

"Changing from a rental power plant to a permanent installation provided by Clarke Energy and using GE's Jenbacher gas engine technology will enable us to save in excess of US$200,000 per year in fuel costs," said Fofou Gregoire, project manager at SCTB.

"Installing a permanent on-site power solution also will help us improve our mill's availability so we can meet our production targets."

**Savings from projected power supply**

Clarke Energy worked with SCTB to develop a technical solution to deliver a permanent supply of reliable electricity from pipeline-sourced natural gas. The projected savings in fuel costs was a significant driver for the gas engine's installation. The project marks the first Jenbacher engine that Clarke Energy has supplied to SCTB.

"GE's gas engine technology has been proven to be an attractive technical and commercial solution for Cameroon. This installation will be our first in Cameroon and will immediately start to deliver cost savings and reliable energy to our customer SCTB," said Ali Hjaiej, business development director - Africa, Clarke Energy.

By increasing its gas-to-power efficiency rate and reducing diesel fuel consumption, SCTB also will be able to reduce carbon emissions at its mills.

"We are pleased to provide our first Jenbacher gas engine in Cameroon as part of our new distributor agreement with Clarke Energy. The J420 gas engine will enable SCTB to save on fuel while accessing reliable power for its operations," said Oluwatoyin Abegunde, sub-Saharan region leader for GE's Distributed Power business. "The project illustrates how GE's technology is able to support Cameroon's needs for a more sustainable supply of electricity."

**A permanent, reliable solution**

SCTB has been a key player in Cameroon's food industry since 1996 and is a leading producer and exporter of flour. The company's flour mill is located at the Bassa Industrial Zone in the city of Douala, the major industrial hub of the country.

With Cameroon's unstable grid causing local power outages, industrial operators have experienced unplanned downtime for their factories, resulting in losses from reduced production levels. As a result, a number of factory owners first turned to diesel generators to produce on-site power. SCTB decided to switch from diesel engines to gas-fired reciprocating engines to prove the feasibility of natural gas-fueled generation in Cameroon. Based on the rental units' success, SCTB chose to install a new permanent Jenbacher gas engine solution to provide a reliable supply of electricity supply to the flour mills. ■

**The GE J420 Jenbacher gas engine, supplied by Clarke Energy**

# Lower capital spend for customers

## Stornetic helps businesses in all sectors use motors to store energy in megawatts

Energy storage systems company Stornetic has launched a megawatt energy storage unit. The DuraStor 1000, with its one megawatt output, is the energy storage system manufacturer's step into a new output category. Despite the increased output, the unit takes up less space. Like the 600 kilowatt system 'ES600', which has been in operation since last year, the DuraStor 1000 is supplied in a 40-foot standard container.

**Power of the flywheel quadrupled**

"The decisive factor in this breakthrough was the increased output of the individual flywheel," explained Stornetic's managing director, Dr Rainer vor dem Esche. "Our engineers succeeded in quadrupling the output of the flywheel machine."

Stornetic offers its customers significantly more powerful systems. And Dr Rainer vor dem Esche added, "This is particularly appealing for our customers, because it appreciably lowers the capital expenditure for applications with short delivery times."

**Modular structures**

Stornetic combines the features of mechanical energy storage units such as robustness and longevity with the characteristics of container solutions, such as faster installation and compactness. Furthermore, a DuraStor system is modular in structure. Depending on the customer's requirements, a number of systems can be linked together or any number of individual devices combined to form bespoke, smaller systems. Stornetic energy storage units provide power to applications as frequency control, wind firming, peak power and stabilization of microgrids, power quality and regenerative breaking of metros and trams.

> **"The flywheel-based energy storage unit enables Stornetic clients to transform electrical energy into rotation energy and store it"**

The DuraStor 1000 energy storage unit comprises 16 flywheels ('EnWheel'), which can be accelerated to a speed of up to 45,000 revolutions per minute. This transforms electrical energy into mechanical energy. When recovering energy, the motor acts as a generator, producing electric current while slowing down the rotor. The reaction time of an EnWheel is in the range of 50 milliseconds. The devices are designed for an operating life of 20 years under conditions of alternating stress. The storage unit operates purely mechanically - ie without the use of chemicals - and is made of materials that are fully recyclable. ■

**Stornetic's first megawatt energy storage unit, the DuraStor 1000, is a decisive step into a new output category; the flywheel-based unit enables the company's clients to transform electrical energy into rotation energy and store it (Photo: PRNewsFoto/Stornetic)**

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# SDMO hosts technical seminar in Gabon

In total, 46 people attended the event in Libreville.

Spot, distributor for French genset manufacturer SDMO in Gabon, organised a technical seminar for approximately 40 invitees with the objective of presenting SDMO and its expertise in the field of special projects.

Held in February 2016, SDMO's Jean-Hervé Guinvarc'h and David Léon took part in the technical seminar at the Hotel Boulevard in Libreville, Gabon. Régis Cuynat of Spot, which has been a partner of SDMO for more than 10 years, responded positively to the proposal put forward by Jean-Hervé Guinvarc'h and conducted all of the preparations for the meeting of professionals in Gabon.

Representatives from SDMO's International Contracts Department gave a general presentation of the company while focussing on the field of special projects and engineering. Particular attention during the presentation was paid towards fuel, with explanations offered to attendees on topics including the installation of tanks and centrifuge systems.

The topic of fuel, says SDMO, is of particular importance in Gabon, where diesel is frequently of a poor quality. Participants were also given the opportunity to find out about one of the fuel options on one of the exhibited products, an enclosed J110 with galvanised double-wall chassis, which is suitable for saline environments.

The customers who attended came from a number of different sectors, including military, telecoms, utilities and the public sector. A Q&A session rounded off the morning event, with feedback from the seminar proving to be very enthusiastic, according to SDMO.

The company now plans to repeat the presentation exercise within the next couple of years in Gabon, while other similar seminars will take place over the coming months in other countries throughout West Africa.

In December 2015, SDMO also participated in the Archibat exhibition in Abidjan, in collaboration with its Cote d'Ivoire distributor ADEMAT. At the event SDMO presented its products and expertise.

ADEMAT took advantage of the event and the presence of the SDMO sales team to organise two Power Solutions seminars. The half-day meetings were attracted 90 attendees across the two sessions. ■

## New vehicle of intervention for Burkina Faso dealer

SDMO's distributor in Burkina Faso, PPI, has been equipped with a new vehicle of intervention in the colours of SDMO. The company says that it hopes this will prove an "effective way to enhance our products", as well as help to boost the skills of its local partner in the West African country.

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# Making transformers that last longer

## Generator sales are boosted by the availability of packaged transformers at a local and international level

According to the Power Rental Market by End User Report published in June 2015, the global power rental market is projected to grow from an estimated US$11.6bn in 2015 to US$21.3bn by 2020, at a compound annual growth rate CAGR of 12.9 per cent. Originally built upon a niche market, the temporary power industry is relatively new and a good proportion of the power industry is still unaware of the flexibility that it offers to the wider market-place.

Although Crestchic is established in power generation from loadbank manufacture, temporary power is an area that still shows great potential and it is important that the industry keeps abreast of the benefits of products like multi-tap transformers in order to revolutionise power generation. We are seeing the regional and international temporary power business as the main driver behind the sales of step-up transformers, mostly where companies require a multi megawatt (MW) temporary power station at short notice. These can be provided by rental operators supplying reciprocating high-speed diesel and gas generators. Initially, industry leaders were tapping into areas where local energy providers were unable to supply power of the scale required or even at all - for example, for natural disasters or major sporting events.

**Where is the demand?**

Take, for example, Africa, where there is an insatiable, unstoppable demand for power. A continent which contains some of the fastest growing economies however, transmission and distribution generation capacity is generally under-developed and under-invested. Building multi-megawatt (MW) power stations can take years to design, build and commission – the type of power that temporary rental power stations can provide in less than eight weeks. There is a vast growth in population but this is not married with the pace of utility infrastructure development. Another area creating demand for packaged portable transformers is the offshore oil & gas sector. Facilities are predominantly located in remote areas and away from the main electricity grid. Many facilities are being decommissioned, a process which can be highly demanding of power. Emergency breakdowns remain a key market area, where failure of old installed sub-stations may occur and especially in high value and time critical industries where plants need to be up and running quickly again to avoid costly downtime.

Packaged portable step-up transformers are a complementary product for customers renting high or low speed generators. Crestchic's packaged offering includes both cast resin and oil filled transformers designed and built to specification by a number of major transformer manufacturers.

**Built of steel**

Crestchic's oil-filled transformers are built with significant strengthening in the oil tanks and are more robust for the punishing environments of the portable rental market which we sell into. This could be anywhere from the Middle East, Africa, or even offshore oil and gas. Customers in this market-place have significant demands and the packaged transformers need to be highly robust due to the harsh rental environment. However, along with this they need to be easily transportable. It is extremely common for old shipping containers to be re-used for this purpose, as they are readily available at low cost. However, recycled shipping containers are not necessarily the most robust solution, because cutting holes in the existing containers weakens the steel and general structural integrity. By manufacturing containers that are bespoke in design and engineered to be portable, Crestchic ensures that they are as strong and safe as possible. Using cross-sectioned steel and additional steel in the build process ensures a minimum lifespan of 10 years. Furthermore the structural integrity is recognised by the Lloyds Register Quality Assurance (LRQA).

**The veins of the packaged transformer**

The sole reason for packaging portable transformers is to ensure accessibility and flexibility. This means no time is wasted dealing with several suppliers to obtain components such as the transformer itself, switchgear, ancillary electrical items and enclosures. There are also no costs for on-site assembly and little to no civil engineering is required. If an organisation is generating electricity between 400 – 480 Volts (V) at 50 to 60 Hertz (Hz), transformers step-up from this to a range of voltages typically anywhere between 3.3kV V and 36kV with multiple voltage taps available at a range of voltages in between, depending on the customer's location in the world. Essentially this creates the capability of generating significant amounts electricity at a low voltage and which is then easily introduced onto medium/high voltage grid systems.

Inside the container sit various components such as the input isolators, cooling fans and extraction, voltage tap selection and medium/low voltage switchgear arrangement. Everything is kept in separate compartments to accommodate the main transformer and ABB Safe Plus medium voltage switchgear, another important feature of the packaged transformer. Crestchic operates from two to four MVA in a 10 foot container and up to eight MVA in a 20 foot container. The voltage range covers a multitude of international standard grids and industrial applications at relevant frequencies – they have to be global because customers use them all over the world which allows them to work in broad spectrum of countries. ■

*Paul Brickman, sales and marketing director, Crestchic Limited*

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# Take time to consider temporary power

As profitability falls and capital expenditure budgets are cut, Aggreko is seeing more and more oil and gas companies looking to reduce their costs and capital investment by increasingly renting specialist power generation and temperature control equipment. Renting is often a lower cost, lower risk and more flexible option than buying equipment. Our clients can also avoid the time consuming process involved with getting capex signoff, and instead, use operational or maintenance budgets.

**Meeting variable power demands**

A key benefit of hiring generators comes from their flexibility. When customers buy generators they will specify equipment to meet their project's current power demand, but requirements often change over time. When demand falls for example, the generators could be working inefficiently, wasting fuel and creating the possibility of excessive emissions. While if requirements increase, then an additional power source will be required.

Temporary generators offer a flexible solution, as they can be hired on a long or shortterm basis and can be scaled up or down with very short lead times, to meet varying power requirements. Renting power reduces the responsibility and risk with respect to servicing and maintenance. Using rental generators moves the risk and responsibility of service, maintenance and repair to us and away from the customer, who have assurance that the equipment is fully tested and serviced ready for immediate use, rather than relying on their own equipment that can deteriorate overtime and prove unfit for purpose if it's not regularly serviced. As managers increasingly seek budget certainty, the Aggreko team looks for more ways to support. A site survey carried out by engineers can provide detailed and accurate project budgets for turnkey solutions, from consultancy through to installation, service and repair, and eventual removal. We are seeing increased demand for our fixed cost model, which includes ancillary equipment, spares, servicing and maintenance.

**Flexible solutions for oil and gas lifecycle**

Rental power and temperature control solutions are increasingly being used during all phases of the exploration and production life cycle. This includes:

- **Construction:** Temporary power is often required for construction projects without adequate mains supply, both for on and offshore applications.
- **Commissioning:** Power can be required during hookup, whilst hired loadbanks can be used to load test emergency generators and UPS units to ensure full functionality before they go online.
- **Backup power:** Rental generators can be used to fill power gaps and ensure that full production continues if the regular power supply is disrupted. For facilities without backup power, temporary generators can be available on standby to provide a reliable, cost effective emergency power source.
- **Secondary power:** The power demands of many facilities often meet or even exceed their maximum power supply. If there are additional power or voltage requirements, e.g. for construction or drilling projects, to power cranes, pumps or drill rigs etc, temporary generators may be used.
- **Planned shutdowns and maintenance:** Temporary power provision can be used during periods of planned maintenance to allow operations to run as normal or with minimum interruption.
- **Accommodation:** Providing power and comfort cooling for worker accommodation.
- **Decommissioning and abandonment:** Rental power can be used as part of the deconstruction activity. The power provision can be scaled up or down to meet the specific needs of the project as it progresses, including critical power on normally unmanned installation (NUI) and minimally manned installation (MMI) facilities. ■

*Russell Brown, area sales manager for oil and gas, Aggreko*

# Genset Buyers' Guide

**Section One: Suppliers Listing / Section Two: Agents in Africa**
**Please mention African Review when contacting your supplier**

## Section One: Listings by Supplier

### ABZ-Aggregate-Bau GmbH & Co. KG

**Gutenbergstrasse 11**
**Henstedt-Ulzburg, 24558**
**Germany**
**Tel: +49 4193 90360**
**Fax: +49 4193 93473**
**Web: www.abz-power.com**
**E-mail: info@abz-power.com**

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### Advanced Diesel Engineering Ltd.

**14 Langthwaite Business Park**
**South Kirkby, Pontefract**
**West Yorkshire, WF9 3AP**
**United Kingdom**
**Tel: +44 1977 658100**
**Fax: +44 1977 608111**
**Web: www.adeltd.co.uk**
**E-mail: enquiries@adeltd.co.uk**

For nearly 20 years Advanced Diesel Engineering has supplied diesel generators for standby operation, emergency backup power and primary power operation. We hold a large stock of diesel generators from 11 to 3300kVA, specialising in the acoustic treatment, containerisation and climate control of medium to high power generator systems.

### Aggreko International

**PO Box 17576, Jebel Ali**
**Dubai**
**United Arab Emirates**
**Tel: +971 4 8086888**
**Fax: +971 4 8834145**
**Web: www.aggreko.com**
**E-mail: enquiries@aggreko.com**

Aggreko International Power Projects provides complete power packages including design, installation, operation and maintenance. Aggreko can offer rental of multi-megawatt power packages from 30kVA to 200MW and over. Also HV/LV transformers, resistive/reactive load banks, switchgear, cable and ancillary products and services.
Engine type: Cummins - suitable for 50Hz or 60Hz operations

**Agents:**
Nigeria - Aggreko Projects Ltd.
South Africa - Aggreko Energy Rental SA (Pty) Ltd.

### AJ Power Ltd.

**1 Charlestown Drive**
**Craigavon**
**Northern Ireland, BT63 5GA**
**United Kingdom**
**Tel: +44 28 38361000**
**Fax: +44 28 38361010**
**Web: www.ajpower.net**
**E-mail: sales@ajpower.net**

AJ Power specialises in the volume manufacture and design of diesel generating sets from 10kVA to 3350kVA, associated equipment and HV solutions up to 13.8kV. The companies' strength lies in engineering excellence built on experience. Drawing on these skills and utilising the latest technology we provide a cost effective, reliable source of power with suitable solutions to cover a wide range of industries.

All products are designed, manufactured and tested, in our UK factory using European components, fully supported by our dedicated engineering and aftersales team in partnership with our distribution network.

### AKSA Jenerator San. AS

**Rüzgarlibahçe Mahallesi Selvi Çikmazi No:10**
**Beykoz/Istanbul**
**34805, Turkey**
**Tel: +90 216 6810000**
**Fax: +90 216 6815784**
**Web: www.aksa.com.tr**
**E-mail: aksa@aksa.com.tr**

For over 30 years AKSA Power Generation has manufactured generator sets from 1kVA upto 3000kVA, supplied comprehensive spare parts, rental solutions and customer focused after sales services all around the world.

For sourcing in Africa, please contact:
AKSA Power Generation FZE
(AKSA Africa Headquarters)
PO Box 18167
Warehouse No. RA08 / LC07
Jebel Ali, Dubai, UAE
Tel: +971 4 8809140
Fax: +971 4 8809141
Web: www.aksa.ae
Email: sales@aksa.ae

**Agents:**
Algeria - EURL AKSA Générateurs Algérie

### Altaaqa Global CAT Rental Power

**PO box 262989**
**Bldg VA-01, Blue Shaded Warehouses**
**Jebel Ali Free Zone North**
**Jebel Ali, Dubai, United Arab Emirates**
**Tel: +971 4 8808006**
**Fax: +971 4 8808007**
**Web: www.altaaqaglobal.com**
**E-mail: rbagatsing@altaaqaglobal.com**

Altaaqa Global, subsidary of Zahid Group, has been selected by Caterpillar Inc. to deliver multi-megawatt turnkey temporary power solutions. The company owns, mobilizes, installs and operates temporary independent power plants at customer sites, focusing on markets in Sub-Sahara Africa, Central Asia, Indian Subcontinent, Latin America, South East Asia and MENA.

**Agents:**
Kenya - Altaaqa Global CAT Rental Power, East Africa
South Africa - Altaaqa Global CAT Rental Power, Southern Africa

### Ansaldo Energia S.p.A.

**Via Nicola Lorenzi, 8, Genova**
**16152, Italy**
**Tel: +39 0606 551**
**Fax: +39 010 6553411**
**E-mail: ansaldoenergia@ansaldoenergia.it**

With an installed capacity of over 180.000mW in more than 90 countries and workforce of about 3.500. Ansaldo Energia is Italy's largest supplier, installer and service provider for power generation plants and components. A leading international player and one of the finest expressions of Italina Technology and Innovation in the energy sector.

**Agents:**
South Africa - Ansaldo Energia S.p.A.

### Ascot Industrial S.r.l

**Zona Industriale, Terza Strada**
**93012, Italy**
**Tel: +39 0933 901192**
**Fax: +39 0933 917682**
**Web: www.ascotinternational.com**
**E-mail: sales@ascotinternational.com**

Ascot is an Italian company providing Power Solution tailored according to customer needs. Innovative hybrid technology, equipped with remote control, are realized in order to guarantee a full management and highest efficiency. More than 5000 Ascot Hybrid Power Unit are installed worldwide The Ascot mission is "Energy Everywhere".

### Atlas Copco Portable Energy Division

**Grupos Electrógenos Europa S.A.U**
**Polígono Pitarco II, Parcela 20**
**Muel, 50450, Spain**
**Tel: +34 97 6145432**
**Fax: +34 97 6145431**
**Web: www.atlascopco.com**
**E-mail: communication.power@es.atlascopco.com**

Portable Energy is a division within Atlas Copco's Construction Technique business area. It develops, manufactures and markets portable compressors, high pressure boosters, generators, light towers and portable dewatering pumps worldwide. Products are offered under several brands to a wide range of industries including construction, mining, oil and gas and rental. The divisional headquarters and main development centre are located in Antwerp, Belgium. Its Portable Power Competence centre is based in Zaragoza, Spain. Production facilities are located around the world, mainly Belgium, Spain, USA, India, Brazil and China.

**Agents:**
Algeria - Atlas Copco Algeria S.p.A
Angola - Atlas Copco Angola, Lda.
Benin - Atlas Copco Senegal SARL
Botswana - Atlas Copco South Africa (Pty) Ltd. Construction Technique
Burkina Faso - Atlas Copco Senegal SARL
Burundi - Atlas Copco Tanzania Ltd.

Cameroon - Atlas Copco Senegal SARL
Central African Republic - Atlas Copco Senegal SARL
Chad - Atlas Copco Senegal SARL
Congo DR - Atlas Copco Zambia Ltd.
Cote D'Ivoire - Atlas Copco Senegal SARL
Djibouti - Atlas Copco Tanzania Ltd.
Eritrea - Atlas Copco Tanzania Ltd.
Ethiopia - Atlas Copco Tanzania Ltd.
Gabon - Atlas Copco Senegal SARL
Gambia - Atlas Copco Senegal SARL
Ghana - Atlas Copco Ghana Ltd.
Guinea - Atlas Copco Senegal SARL
Guinea Bissau - Atlas Copco Senegal SARL
Kenya - Atlas Copco Tanzania Ltd.
Liberia - Atlas Copco Senegal SARL
Madagascar - Atlas Copco Tanzania Ltd.
Malawi - Atlas Copco Zambia Ltd.
Mali - Atlas Copco Senegal SARL
Mauritania - Atlas Copco Senegal SARL
Mauritius - Atlas Copco Tanzania Ltd.
Morocco - Atlas Copco Maroc SA
Mozambique - Atlas Copco South Africa (Pty) Ltd. Construction Technique
Namibia - Atlas Copco South Africa (Pty) Ltd. Construction Technique
Niger - Atlas Copco Senegal SARL
Nigeria - Atlas Copco Nigeria Ltd.
Rwanda - Atlas Copco Tanzania Ltd.
Senegal - Atlas Copco Senegal SARL
Seychelles - Atlas Copco Tanzania Ltd.
Sierra Leone - Atlas Copco Senegal SARL
Somalia - Atlas Copco Tanzania Ltd.
South Africa - Atlas Copco South Africa (Pty) Ltd. Construction Technique
Tanzania - Atlas Copco Tanzania Ltd.
Togo - Atlas Copco Senegal SARL
Uganda - Atlas Copco Tanzania Ltd.
Zambia - Atlas Copco Zambia Ltd.
Zimbabwe - Atlas Copco Zimbabwe Pvt. Ltd.

## Ausonia S.r.l.

**Via Favara 452, Z.I.**
**Marsala (TP)**
**91025**
**Italy**
**Tel: +39 9023 722311**
**Fax: +39 9023 721274**
**Web: www.ausonia.net**

Since 1932, we design, produce and offer a wide range of AC gensets up to 3000 kVA, available in different configurations (Open-sets, Soundproofed canopies or shelters, Mobile sets on trailers, No-Break Power Systems, Gas gensets, Cogeneration power plants, etc). Within our power products portfolio, we also include customized solutions for very critical applications (Oil & Gas, Mining, Defense, Telecom), as well as Hybrid Gensets and High Efficiency DC Energy Solutions. OPEX model also available.

## Ayerbe Industrial de Motores SA

**C/ Oilamendi 8**
**Pol. Ind. Jundiz**
**Vitoria, 01015**
**Spain**
**Tel: +34 94 5292297**
**Fax: +34 94 5292298**
**Web: www.ayerbe.net**
**E-mail: ayerbe@ayerbe.net**

Ayerbe has been manufacturing generators since 1992 and nowadays is one of the leading manufacturers in Spain. The range goes from 2 to 250kVA.

## Balton CP Ltd.

**CP House**
**Otterspool Way**
**Watford**
**WD25 8HU**
**United Kingdom**
**Tel: +44 1923 228999**
**Fax: +44 1923 222929**
**Web: www.baltoncp.com**
**E-mail: tk@baltoncp.com**

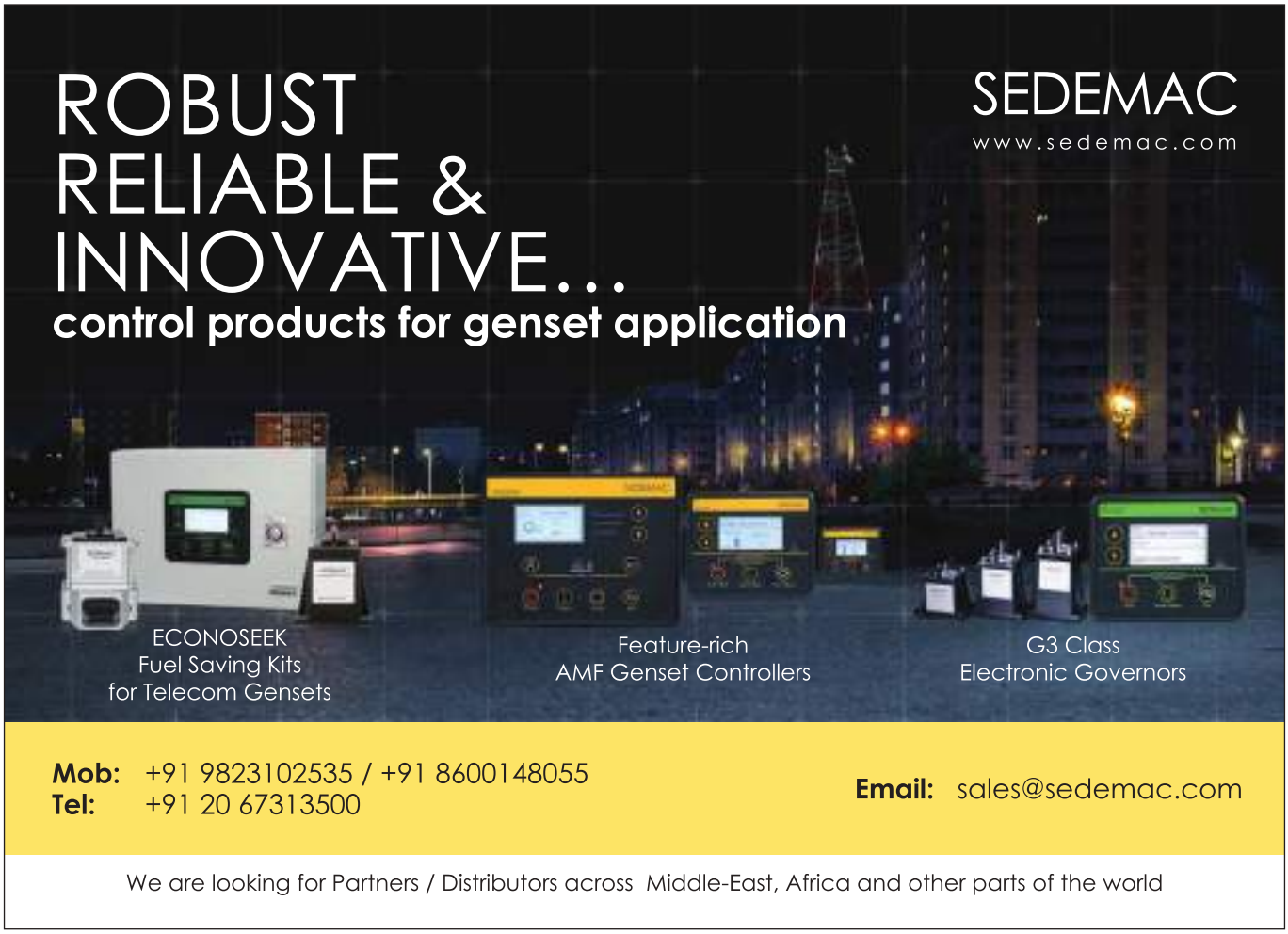
Balton CP Ltd. Group, through its local subsidiaries in Sub-Saharan Africa, supply, install and maintain a comprehensive range of power generators from 5kVA to 2000kVA with Perkins and Engines. Also included in our range are lighting towers, UPS/Voltage regulators and hybrid power generation units for the telecom industry.

**Agents:**
Ghana - Dizengoff Ghana Ltd. (Balton)
Rwanda - Balton Rwanda Ltd.
Tanzania - Balton Tanzania Ltd.
Uganda - Balton (U) Ltd.

## Barloworld Power

**136 Main Reef Road**
**Boksburg North**
**Gauteng**
**1460**
**South Africa**
**Tel: +27 11 8980000**
**Web: www.barloworldpower.com**
**E-mail: snaidoo@barloworldpower.com**

Barloworld Power, Cat dealer for 87 years, is strategically positioned to meet a broad range of energy and commercial engine solutions in the southern African market. The commercial offering extends to include mining and construction equipment in the form of diesel and gas generators, marine propulsion and locomotive engines.

## Bredenoord

**Zutphensestraat 319**
**WT Apeldoorn, 7325, Netherlands**
**Tel: +31 55 3018501**
**Fax: +31 55 3018500**
**Web: www.bredenoord.com**
**E-mail: info@bredenoord.com**

Bredenoord provides reliable power solutions, i.e. off-grid solar-based power plants, smart powerbanks, 5-20mW rental powerplants, 15-2000kVA gensets. Wherever and whenever you need them. Smart energy solutions with quality and reliability that save you money. Bredenoord: Rental, Service & Sales.

**Agents:**
Ghana - Davero Electrical Engineering (Dealership)
Kenya - Bredenoord & Giertsen

## Broadcrown Ltd.

**Airfield Industrial Estate**
**Hixon, Stafford, ST18 0PF, UK**
**Tel: +44 1889 272200**
**Fax: +44 1889 270971**
**Web: www.broadcrown.com**
**E-mail: info@broadcrown.co.uk**

Broadcrown offers a comprehensive range of diesel and gas generator systems. Broadcrown standard sets range from 6kVA to 3350kVA and up to +30mVA for bespoke systems.
All packages are designed and built in the UK using components from globally established, reputable suppliers. All Broadcrown products carry world-wide warranties. Full technical support and after sales services are provided throughout Africa by a network of agents. For detailed technical specifications visit www.broadcrown.com.

**Agents:**
Angola - Socinter
Ghana - B & D Consultancy Co. Ltd.
Ghana - Power Logistics Co. Ltd.
Kenya - Holman Brothers (EA) Ltd.
Madagascar - S.R.C.D.
Mozambique - Macquip Lda.
Nigeria - Broadcrown (West Africa) Ltd.
Sierra Leone - CEMMATS Group
South Africa - Innovative Power Equipment
Sudan - Ibrahim Abu Hassanein & Co.
Uganda - Terrain Plant Ltd.
Zambia - Cable Network Solutions
Zimbabwe - Desthold Pvt. Ltd.

## C. Woermann GmbH & Co. KG

**Afrikahaus, Grosse Reichenstrasse 27**
**Hamburg, 20457, Germany**
**Tel: +49 40 3281110**
**Fax: +49 40 32811122**
**Web: www.c-woermann.com**
**E-mail: info@c-woermann.de**

Technical supplier for industrial machinery, workshop equipment and services, handling equipment, construction machines and agricultural equipment, forestry equipment, generators, spare parts.

**Agents:**
Angola - C. Woermann (Angola) Lda.
Ghana - C. Woermann (Ghana) Ltd.
Nigeria - C. Woermann (Nigeria) Ltd.

## C.G.M. Gruppi Elettrogeni S.r.l.

**Via Decima Strada 3**
**Arzignano (VI), 36071, Italy**
**Tel: +39 0444 673712**
**Fax: +39 0444 675384**
**Web: www.cgmitalia.it**
**E-mail: stefano@cgmitalia.it**

CGM Gruppi Elettrogeni was established in 1980 in Italy. We export to 124 countries in 5 continents through out 51 certified distributors. We manufacture 3 to 2500kVA generators, lighting towers, and motor welding sets and provide an efficient after-sales service, maintenance and hire contracts.

## Caterpillar Inc.

**PO Box 610, Mossville, IL**
**61552-0610, USA**
**Tel: +1 309 5786298**
**Fax: +1 309 5782599**
**Web: www.cat.com**

For more than 80 years, Caterpillar® has been supplying diesel and natural gas generator sets for continuous duty and temporary power customers. As a leading global power supplier, Caterpillar offers a broad range of integrated power systems pre-configured products for optimum performance – all supported by the worldwide Cat® dealer network.

## Clarke Energy

**Senator Point, South Boundary Road**
**L33 7RR, United Kingdom**
**Tel: +44 151 5464446**
**Web: www.clarke-energy.com**
**E-mail: georgia.griffiths@clarke-energy.com**

Clarke Energy is a multinational specialist in the engineering, installation and maintenance of reciprocating engine based power plants and gas engine compression stations. Our offering ranges from supply of an engine, through to turn-key installation of a multi-engine power plant. Delivering fuel efficiency and to help reduce carbon emissions.

## COELMO S.p.A

**Agglomerato Industriale ASI**
**Acerra (NA), 80011, Italy**
**Tel: +39 081 8039731**
**Fax: +39 081 8039724**
**Web: www.coelmo.it**
**E-mail: sales@coelmo.it**

Coelmo is one of the oldest European manufacturers of industrial and marine generators from 3kVA up to 3000kVA. Based in Italy, with a large stock of Generating Sets available to be shipped overnight to any destination in the world. Company profile, products and models are available online at www.coelmo.it.

## Crestchic Loadbanks

**Second Avenue, Centrum 100**
**Burton on Trent**
**DE14 2WF**
**United Kingdom**
**Tel: +44 1283 531645**
**Fax: +44 1283 510103**
**Web: www.crestchic.co.uk**
**E-mail: sales@crestchic.co.uk**

Crestchic manufactuers loadbanks which provide accurate and stable electrical test loads for the commissioning and maintenance of power systems; including diesel generators, gas turbines and UPS systems. Our resistive loadbanks offer capacities as small as 20kW up to 6000kW and resistive-reactive units from 50 to 6250kVA at various voltages 110V-34kV.

## Cummins Generator Technologies

**Fountain Court**
**Lynchwood Business Park**
**Peterborough, PE2 6FZ**
**United Kingdom**
**Tel: +44 1733 395300**
**Web: www.stamford-avk.com**
**E-mail: george.swindale@cummins.com**

Cummins Generator Technologies designs and manufactures premium quality alternators up to 11,000kVA under the STAMFORD and AvK brands. Internationally renowned for built-in quality, its alternators set the standard for ruggedness, reliability and versatility. The company has several manufacturing facilities with superior customer support across the world.

**Agents:**
South Africa - Cummins South Africa

## Cummins Power Generation

**8 Harrowdene Office Park**
**Western Service Road**
**Woodmead**
**Johannesburg**
**South Africa**
**Tel: +27 11 5898400**
**Fax: +27 11 5898450**
**Web: www.cumminspower.com**
**E-mail: cpg.uk@cummins.com**

**Agents:**
Algeria - Cummins Energie Algerie
Angola - Cummins Angola
Congo DR - BIA Overseas
Congo Republic - Approvisionnement Congo Service
Cote D'Ivoire - Cummins Cote D'Ivoire SARL
Egypt - EIM - Egyptian International Motors
Ghana - Cummins Ghana Ltd.
Kenya - Car & General (K) Ltd.
Libya - United Group Co.
Morocco - Soberma Groupe Auto Hall
Nigeria - Cummins West Africa Ltd.
Senegal - Matforce
South Africa - Cummins South Africa
Tunisia - Sotudis

## Deep Sea Electronics PLC

**Highfield House, Hunmanby**
**Industrial Estate, Hunmanby**
**North Yorkshire, England**
**United Kingdom**
**Tel: +44 1723 890099**
**Fax: +44 1723 893303**
**Web: www.deepseaplc.com**
**E-mail: sales@deepseaplc.com**

DSE is a UK manufacturer of Genset & ATS Controls, Battery Chargers & Power Supplies. With an outstanding worldwide reputation for a range of expertly engineered products that offer user friendly operation, and with 24hr global support there's no surprise DSE is the worlds number 1.

## DEUTZ DIESELPOWER

**5 Tunney Road**
**Elandsfontein, 1406**
**South Africa**
**Tel: +27 11 9230600**
**Fax: +27 11 9230685**
**Web: www.deutz.co.za**
**E-mail: info@deutz.co.za**

DEUTZ DIESELPOWER, a member of the HUDACO Group is the Sole Distributor of DEUTZ products and services for South Africa and certain key Anglophone African countries. Long service life, reliability and cost effectiveness are synonymous with DEUTZ engines and it is characteristics that have made them world-famous.

## Diesel Engines Online b.v.

**Augustapolder 11, Barendrecht**
**2992 SR, Netherlands**
**Tel: +31 180 699273**
**Fax: +31 180 699274**
**Web: www.dieselenginesonline.com**
**E-mail: cynthia@dieselenginesonline.com**

We deliver genuine Cummins spare parts & engines. With over 40 years experience we can provide technical advice and comprehensive solutions to complex technical solutions. Large stock and good prices. We also supply hydraulic marine transmissions which are produced by one of the leading manufacturers in the world.

## DiPerk Power Solutions

**Kingsbridge Centre**
**Sturrock Way**
**Peterborough**
**PE3 8TZ**
**United Kingdom**
**Tel: +44 1733 334500**
**Fax: +44 1733 334553**
**Web: www.diperk.co.uk**

Manufacturer of diesel generators from 9kVA to 2250kVA.
Both open and sound attenuated utilising Perkins engine range and alternators from various UK manufacturers control systems base on Deepsea controllers.

Clarke Energy®

Engineer - Install - Maintain

# Electrical output range 0.3–9.4MW

# High efficiency diesel engine 2.5MW

Clarke Energy is a multinational specialist in the engineering, installation and maintenance of gas and diesel engine power plants. We are either able to supply a genset or provide a turn-key installation of a multi-engine power plant, backed up by reliable local service.

Distributor & Service Provider
Reciprocating engines

South Africa Tel. +27 31 763 3222
Nigeria Tel: +234 (0) 1 2122522
Tanzania Tel: +27 31 763 3222
Tunisia Tel: +216 71 19 00 06

Algeria Tel +213 21 60 90 77
Botswana Tel. +27 31 763 3222
Mozambique Tel. +27 31 763 3222
Cameroon Tel. +237 677 285665

## Dresser-Rand (A Siemens Business)

**Barrio de Oikia, 44, Gipuzkoa, 20759 Spain**
**Tel: +34 94 3865200**
**Fax: +34 94 3865210**
**Web: www.dresser-rand.com**
**E-mail: guascor@dresser-rand.com**

**Agents:**
Egypt - Proserve
Mozambique - Tecnel Service Lda.
South Africa - Zest Energy (Pty)

## Dynaset

**Menotie 3, 33470 Ylöjärvi, Finland**
**Tel: +358 3 3488200**
**Fax: +358 3 3488222**
**Web: www.dynaset.com**
**E-mail: info@dynaset.com**

Dynaset is the global leading manufacturer of hydraulic generators, power washers and compressors. Dynaset hydraulic equipment converts the mobile machine's hydraulic power into electricity, high pressure water, compressed air, magnet and vibration. The company's products are used for hundreds of applications in various industries all around the world.

## Electrotyazhmash, State Enterprise Plant

**299 Moskovsky Ave**
**Kharkov, Ukraine**
**Tel: +38 57 7275059**
**Web: www.spetm.com.ua**
**E-mail: info@spetm.com.ua**

Design and manufacture of turbogenerators, hydrogenerators, hydrogenerator-motors, large DC electric machines, sets of traction equipment for railway and urban transport.

## Elgris Power

**Langerweher Str 10**
**Inden, 52459**
**Germany**
**Tel: +49 1744 710535**
**Web: www.elgrispower.com**
**E-mail: info@elgrispower.com**

Elgris is a company specializing in hybrid power generators with a direct interface for solar power. We have a special focus on Telecom applications and Large Scale power generating for villages.

## ENDRESS Power Generators

**Neckartenzlinger Strasse 39**
**Bempflingen 72658**
**Germany**
**Tel: +49 7123 973745**
**Fax: +49 7123 973750**
**Web: www.endress-generator.com**
**E-mail: sales@endress-generator.com**

German manufacturer of power generators for construction & rental industry and supplier to civil defense units like fire brigades, vehicle builders or disaster management units. We can provide smart generator solutions from 2 - 3,500 kVA including remote control and monitoring systems for mobile and stationary use.

## Energyst

**136 Main Reef Road, Boksburg North**
**Johannesburg, South Africa**
**Tel: +27 11 8980000**
**Web: www.energyst.com**
**E-mail: info.za@energyst.com**

Power generation and temperature control.

## FG Wilson

**1 Millennium Way**
**Springvale Business Park**
**Belfast, BT12 7AL, United Kingdom**
**Tel: +44 28 90495000**
**Fax: +44 28 28261111**
**Web: www.fgwilson.com**
**E-mail: sales@fgwilson.com**

FG Wilson is a world leader in the manufacture of diesel and gas generator sets. With 50 year's experience and a global network of 370 dealers in more than 150 countries, we have developed a reputation for electric power expertise and ongoing technical support. Our product range from 6.8 – 2,500kVA includes open and enclosed generators sets, which offer outstanding value for money as well guaranteeing maximum efficiency and productivity.
FG Wilson understands the unique needs of generator set customers around the world. Whether the requirement is for standby/prime power, rental products or more complex specifications, FG Wilson's Power Solution Team, in close partnership with our dealers, can provide durable product to meet these needs on a project-by-project basis.

## Firefly Solar Generators Ltd.

**Unit 20, Cliffe Industrial Estate**
**South Street, Lewes, BN8 6JL, UK**
**Tel: +44 1273 409595**
**Web: www.fireflysolar.net**
**E-mail: sales@fireflysolar.net**

Firefly is the leading manufacturer of Hybrid Power Generators (HPGs) for Fuel Management, UPS and Stand-Alone Power. The Cygnus™ HPG is available from 5kVA to 24kVA with up to 48kWh autonomy. It can be linked to any diesel generator to save up to 50% in fuel consumption, CO2 and service costs.

## Forest City Export Services Ltd.

**Bowden Hall, Bowden Lane**
**Marple, Cheshire, England, SK6 6NE**
**United Kingdom**
**Tel: +44 161 4490660**
**Fax: +44 161 4490880**
**Web: www.forestcitygenerators.com**
**E-mail: forestcity@compuserve.com**

Supplier of diesel generator sets from 7.5kVA to 2250kVA with Perkins, Volvo or MTU engines coupled to stamford or Mecc-Alte alternators. Sound attenuated enclosures. Control panels and all associated spare parts.

## FPT Industrial S.p.A.

**Via Puglia 15, Turin**
**10156, Italy**
**Tel: +39 011 0073111**
**Fax: +39 011 0074555**
**Web: www.fptindustrial.com**
**E-mail: sales1@fptindustrial.com**

FPT Industrial is a company of CNH Industrial dedicated to the design, production and sales of powertrains for on and off-road vehicles, marine and power generation applications. The company employs approximately 8,000 people worldwide, in ten plants and six R&D centres. The FPT Industrial sales network consists of 100 dealers and over 1,300 service centres in almost 100 countries. A wide product offering, including six engine ranges from 31 kW up to 740 kW and transmission with maximum torque from 200 Nm up to 500 Nm, and a close focus on R&D activities make FPT Industrial a world leader in industrial powertrains.

**Agents:**
Congo DR - Prodimpex SARL
Angola - Unicar
Madagascar - Autodiffusion
Morocco - SEHI
South Africa - Peninsula Power Products
Tanzania - Incar Tanzania Ltd.
Tunisia - Le Moteur Diesel

## G & J Technical Services Ltd.

**PO Box KA30249, Accra**
**Energy House 2**
**43 Ring Road West**
**Obetsebi Lamptey Circle**
**Korle-Bu Road**
**Ghana**
**Tel: +233 302 689178/9/682177/8**
**Fax: +233 302 689177**
**Web: www.gjtechghana.com**
**E-mail: sales@gjtechghana.com**
**customer.service@gjtechghana.com**

We are a company solely involved in the sale, installation and maintenance of diesel engine driven generating sets. Since inception in March 1994, we have supported various sectors of the Ghanaian economy through back-up power supply to a total of over 200megawatts. Our operations are backed by first class after sales support.

## Genco EEC Ltd.

**3/7/8 Pit Lane**
**Ketton**
**Lincs**
**United Kingdom**
**Tel: +44 1780 721619**
**Fax: +44 1780 721385**
**Web: www.gencoeec.co.uk**
**E-mail: generators@gencoeec.co.uk**

UK manufacturers of domestic, agriculture, marine and oil & gas alternators. High quality, robust and designed for low maintenance. Power range 2-350 kVA, 2 and 4 POLE customers' special requirements are welcomed.

## Genmac S.r.l.

**Via Don Minzoni 13, Gualtieri (RE)**
**42044, Italy**
**Tel: +39 0522 222311**
**Fax: +39 0522 222330**
**Web: www.genmac.it**
**E-mail: info@genmac.it**

GENMAC manufactures generators in Italy since 1983. GENMAC offers a complete range of generators and accessories from 2kW to 2000kVA, open and supersilent, in parallel, ATS, remote control, trailers and trolley, spare parts, fuel tanks, technical documentation. All the power solution you need, GENMAC can make it!

## Genpower Ltd.

**Isaac Way, Pembroke Dock**
**Pembrokeshire, SA72 4RW**
**United Kingdom**
**Tel: +44 1646 687880**
**Fax: +44 1646 686198**
**Web: www.genpower.co.uk**
**E-mail: martin.chessell@genpower.co.uk**

Genpower Ltd The Multi Brand Distributor

Brands we distribute-

- **Hyundai Power Equipment** - This range consists of generators, pressure washers, air compressors, water pumps, garden machinery, power tools, replacement petrol engines and light construction equipment. Areas covered: UK, Ireland.
- **BE Pressure** - The range from the Global manufacturer, BE includes Honda Powered products designed for the professional user and rental market- namely Pressure washers, water pumps and generators and a range of accessories for the UK Markets.
- **Evopower** - This is our own brand designed for Internet Sales and Export. We offer a high quality product at an affordable price with comprehensive after sales and support.
- **OEM** - We can supply a wide range of products with your own brand. From full container loads to single unit's ex. our own warehouse. Our team in the Far East will ensure the best quality is delivered time after time.
- **Healthway / Pureroom** - This is an associate company, providing Allergy friendly hotel rooms throughout the UK. Breathe Better, Sleep Better, Live Better.

## Green Power Systems S.r.l.

**Localita Maiano SN**
**Caprazzino di Sassocorvaro (PU)**
**61028, Italy**
**Tel: +39 0722 726411**
**Fax: +39 0722 720092**
**Web: www.greenpowergen.com**
**E-mail: giovanni@greenpowergen.com**

Manufacturer of generating sets up to 2200kVA, 50 and 60Hz.
Green Power Generators offers:

- Generating sets with different engine types: Perkins, Cummins, Deutz, Volvo, John Deere, Iveco, Lombardini, Yanmar, Mitsubishi and Honda
- Generating sets with different alternator types: Mecc Alte, Stamford, Leroy Somer and Marelli
- Telecommunication power solutions
- Customised gensets
- Natural gas and LPG gensets
- Lighting towers
- Welding machines
- Irrigation systems (motorpumps)
- Certifications ISO:9001/2000 and ISO:14001/2004

## HIMOINSA S.L.

**Ctra. Murcia - San Javier**
**Km. 23.6, San Javier/Murcia**
**30730, Spain**
**Tel: +34 96 8191128**
**Fax: +34 96 8191217**
**Web: www.himoinsa.com**
**E-mail: info@himoinsa.com**

HIMOINSA is a global corporation that designs, manufacturers and distributes power generation equipment worldwide. The company adds incomparable application and engineering know-how, excellent design and service capabilities, delivering value beyond the equipment it produces.
The product range that the brand offers includes diesel and gas generator sets, control panels and paralleling systems for standby emergency power, prime power, peak power and distributed power. It also develops hybrid power gensets for the telecom sectors and manufacturers lighting towers for the rental and construction markets.

**Agents:**
Angola - HIMOINSA Angola

## Huegli-Tech Ltd.

**Murgenthalstrasse 30**
**Langenthal**
**4900**
**Switzerland**
**Tel: +41 62 9165030**
**Fax: +41 62 9165035**
**Web: www.huegli-tech.com**
**E-mail: sales@huegli-tech.com**

Huegli-Tech is an engine and genset control company, a leading supplier and wholesaler of accessories for combustion engines, fuelled by diesel and/or gas. Our core competences are generating set controls, engine governing systems, hydraulic starting system, gas engine management systems, ignition systems, engine protection devices, dual fuel conversions, etc.

## Inmesol, S.L.

**Ctra. Fuente Alamo**
**2 Corvera (Murcia), 30153, Spain**
**Tel: +34 968 380300**
**Fax: +34 968 380918**
**Web: www.inmesol.com**
**E-mail: africa@inmesol.com**

Inmesol is an important manufacturer of generator set in a period of industry maturity; it is present in a large number of markets and continues to multiply its production capacity. Inmesol is present across 4 continents with equipment installed in a wide variety of industries, residential areas, sports complexes, public work hospitals, hotels, data centres and telecom, among others.

## Interpower International Ltd.

**PO Box 70, York, YO18 7XU, UK**
**Tel: +44 1751 474034**
**Fax: +44 1751 476103**
**Web: www.interpower.co.uk**
**E-mail: info@interpower.co.uk**

Established for over 25 years, Interpower is a manufacturer of diesel generating sets built to customer specification, ranging from 4 to 4000kVA.
Units built to suit all applications including, industrial, marine, containerised, low noise level, multi-set systems and high voltage generators.
Suppliers include Cummins, Perkins, MTU, Mitsubishi, John Deere, Volvo, Scania, Deutz, Iveco, MAN, JCB, Yanmar, Newage, Mecc Alte, Leroy Somer, AMCO, Marathon and Sincro.
All sets supplied with 1 year unlimited hours international warranty.
New distributors wanted.

## IREM S.p.A.

**Via Abegg 75, Borgone (Torino)**
**10050, Italy**
**Tel: +39 011 9648211**
**Fax: +39 011 9648222**
**Web: www.irem.it**
**E-mail: svm@irem.it**

IREM S.p.A. specialises in design and manufacturing on 1PH and 3PH electro-dynamic voltage regulators and line conditioners – in standards and customized versions – with power ratings from 1 to 4750kVA for indoor and outdoor installation. In business since 1947, IREM is a medium size company (staff 100 people) exporting all over the world. Company certification according to following standards: ISO9001 (since 1983), ISO14001 (since 2000), BS OHSAS 18001 (since 2014). Typical application fields: broadcast, telecommunications, industrial applications, electro-medical appliances, machine tools, manufacturing plants, banks and insurance companies, construction, oil and gas, mining, a.s.o.

**Agents:**
Kenya - Specialised Power Systems Ltd.

## ITCPower Group, Kat Power International S.L.

**Avda. Alguema, 6C, Sta. Llogaia**
**Girona, 17771, Spain**
**Tel: +34 972 538521**
**Fax: +34 972 980537**
**Web: www.itcpower.com**
**www.itc-power.com.cn**
**E-mail: info@itcpower.com**

ITCPower Group is a company specialized in the development, manufacturing and distributions for Generating Sets from Portable range up to 1200 kVA and Petrol/diesel driven Water Pumps. Our facilities with 120 people, 20.000 sqm and 20.000 sqm allow us to produce over 100.000 units per year.

## James Dring Power Plant Ltd.

**8 Eagle Road**
**Quarry Hill Industrial Park, Ilkeston**
**Derbyshire, DE7 4RB**
**United Kingdom**
**Tel: +44 115 9440072**
**Fax: +44 115 9440235**
**Web: www.jamesdring.co.uk**
**E-mail: james.dring@talk21.com**

Bespoke generators, designed, built, installed and maintained up to 3500kVA in single units, with the option to synchronise and parallel any multiple. Most prime movers and alternator brands are available to customer's choice. Established in 1964, other products include: Frequency Converters, Welders, Fire Pumps, Marine Generators and Auto Load Banks.

## JCB Power Products

**Lakeside Works, Denstone Road**
**Rocester, Staffordshire, ST14 5JP**
**United Kingdom**
**Tel: +44 1889 590312**
**Web: www.jcbgenerators.com**
**E-mail: generator.sales@jcb.com**

JCB offers a range of high specification diesel generators ranging from 8-3300kVA. At the heart of each model is a range of robust and reliable engines to meet any customer power requirements; residential, rental, construction, quarrying and mining, agricultural and for use as back-up power supply for hospitals and offices.

**Agents:**
Algeria - S.A.R.L Alger Engins
Angola - M.T.A – Maquinas e Tractores de Angola
Botswana - BH Botswana (Pty) Ltd.
Burkina Faso - CFAO Equipment Burkina Faso
Cameroon - CFAO Equipment Cameroon
Chad - CFAO Motors Chad
Congo DR - CFAO Equipment DRC
Congo DR - CFAO Equipment RD Congo
Congo Republic - CFAO Equipment Congo
Congo Republic - CFAO Equipment Congo
Cote D'Ivoire - CFAO Equipment RCI
Djibouti - A G Tractor FZE / Select International Services
Egypt - Arab Development & Trading Co.
Egypt - IPC
Ethiopia - Ethio-Nippon Technical Company S. Co.
Ethiopia - Gedeb Engineering PLC
Gabon - CFAO Equipment Gabon
Gabon - CFAO Equipment Gabon
Gambia - CFAO Equipment The Gambia
Ghana - CFAO Equipment Ghana
Guinea - CFAO Equipment Equatorial Guinea
Kenya - Ganatra Plant and Equipment Ltd.
Lebanon - The White Alnoras
Mali - Groupe Electrogène Services (GES)
Mauritius - Izumi Systems Ltd.
Morocco - CFAO Equipment Morocco
Nigeria - A G Leventis
Nigeria - RT Briscoe
Senegal - CFAO Equipment Senegal
South Africa - Kemach Equipment (Pty) Ltd.
South Sudan - A G Tractor FZE
Sudan - Diesel Heavy Equipment
Tanzania - Machines and Tractors Tanzania Ltd.
Togo - CFAO Equipment Togo
Tunisia - SAM – Société de l'Automobile et du Matériel
Tunisia - Techni-Air
Uganda - Farm Engineering Industries Ltd.
Zimbabwe - JCB Link

## JMG Ltd.

**15 A Redemption Cresent**
**Apapa - Oshodi Expressway**
**Gbagada, Lagos, Nigeria**
**Tel: +234 7000112233**
**Web: www.jmglimited.com**
**E-mail: marketing@jmglimited.com**

A leader in power generation, electrical infrastructures and industrial equipments, JMG has become the official dealer in Nigeria of the some of the largest companies in the world including FG Wilson (A Caterpillar Brand), Mitsubishi Heavy Industries, Legrand, GE Lighting, Kaeser Compressors and ThyssenKrupp. JMG provides sales and after-sales support of all those brands.

## John Deere Power Systems

**Orléans-Saran Unit**
**BP 11013**
**Fleury Les Aubrais Cedex, 45401**
**France**
**Tel: +33 2 38826119**
**Fax: +33 2 38846266**
**Web: www.johndeere.com**
**E-mail: jdengine@johndeere.com**

John Deere Power Systems manufactures and markets engines for industrial applications such as crushers, loaders, drilling equipments, etc. JDPS also powers agricultural applications, material handling equipment, compressors and generator sets.

**Agents:**
Egypt - Orascom Trading Co. SAE
Morocco - Societe de Realisations Mecaniques
Nigeria - Stag Engineering
South Africa - New Way Motor & Diesel Engineering Ltd.

## Jubaili Bros

**Jebel Ali Free Zone**
**United Arab Emirates**
**Tel: +971 4 8832023**
**Fax: +971 4 8832053**
**Web: www.JubailiBros.com**
**E-mail: jbdubai@jubailibros.com**

Jubaili Bros is one of the leading providers of power solutions in the Middle East, Africa and Asia. With over 35 years of experience in the field of power generation, Jubaili Bros is a perfect choice for your power solution needs. Jubaili Bros serves its customers from 8 countries with 24 branches and through a strong dealer network.

**Agents:**
Ghana - Jubaili Bros
Nigeria - Jubaili Bros Engineering Ltd.
Uganda - Jubaili Bros

## Kipor - South Africa

**2 Lascelles Rd**
**Meadowbrook, Edenvale**
**Gauteng, South Africa**
**Tel: +27 11 2842009**
**Fax: +27 11 2842100**
**Web: www.kiporsa.co.za**
**E-mail: robertk@smithpower.co.za**

Kipor – South Africa imports and distribution agents representing world-wide leading brand Kipor in the materials handling and power generation market. These products are distributed throughout South Africa by a comprehensive dealer network. Full after sales service, support and parts are provided on all our products. We have a dedicated forklift division offering the following products: sales, service, parts, long-term rental, short-term hire and maintenance contracts.

## Kirloskar Oil Engines Ltd.

**L. K. Road, Khadki, Pune**
**411003**
**India**
**Tel: +91 20 25810341/66084574**
**Fax: +91 20 25813208/0209**
**Web: www.kirloskar.com**
**www.koel.co.in**
**E-mail: krishnakumar.mundhada@kirloskar.com**

Kirloskar Group is counted amongst India's largest multi-product, multi-location diversified engineering conglomerates with annual sales of US$ 1.6 billion, Kirloskar Oil Engines was incorporated in 1946 and is the flagship company of the Kirloskar Group. Today KOEL is an acknowledged leader in the manufacturing of Diesel Engines, Agricultural Pumpset's and "Kirloskar Green" Generating Sets Company has state-of-the art manufacturing units in India that offers world class products. KOEL has a sizeable presence in international markets, with offices in Dubai, South Africa and Kenya and representatives in Nigeria. KOEL also has a strong distribution network throughout the Middle-East and Africa.

**Agents:**
Ethiopia - Ultimate Motors PLC
Kenya - Kirloskar Kenya Ltd.
Malawi - HISCO House
Morocco - HIB Agricole SA
Nigeria - Bhojsons PLC
South Africa - Kirloskar Engines South Africa (Pty) Ltd.
South Africa - Kirsons Trading SA (Pty) Ltd.
Sudan - CTC Group
Tanzania - Incar Tanzania Ltd.
Zambia - Saro Agro

## KM Products Europe Ltd.

**The Forum, Units B + D**
**Hanworth Lane Business Park**
**Hanworth Lane**
**Chertsey**
**Surrey**
**KT16 9JX**
**United Kingdom**
**Tel: +44 1932 571991**
**Fax: +44 1932 571994**
**Web: www.kmpbrand.com**
**E-mail: sales@kmpuk.com**

Suppliers of Quality KMP Brand Diesel Engine Parts.

**Agents:**
South Africa - KM Products Europe Ltd.

## KOHLER Co. | Kohler Power Systems

**Kristallaan 1**
**Zevenbergen**
**4761 ZC**
**Netherlands**
**Tel: +31 168 331630**
**Web: www.kohlerpower.com**
**E-mail: powersystems.emea@kohler.com**

Kohler Power Systems offer a complete range of Industrial Generator Sets from 20 to 3300 kVA including sychronising controls, transfer switches, synchronising panels and accessories which work together with integrated communication to power critical applications.

**Agents:**
Angola - Jembas Assistencia Tecnica Lda.

## Leroy-Somer Electric Power Generation

**Boulevard Marcellien Leroy CS 10015**
**Angouleme Cedex 9**
**16915**
**France**
**Tel: +33 5 45945975**
**Fax: +33 5 45685665**
**Web: www.leroy-somer.com**
**E-mail: succursaleisangouleme.ials@emerson.com**

Leroy-Somer alternators from 3 kVA up to 20 MVA are built to fit a wide range of applications: prime power, stand-by, construction, rental, marine, cogeneration, telecom.

They can be driven by reciprocating engines, gas, steam and water turbines. Their standard characteristics enable them to be used in difficult conditions including motor starting, distorting loads, overloads or short circuits (AREP excitation).

## Linz Electric S.p.A

**Viale del Lavoro, 30**
**Arcole (VR)**
**37040**
**Italy**
**Tel: +39 045 7639201**
**Fax: +39 045 7639202**
**Web: www.linzelectric.com**
**E-mail: info@linzelectric.com**

Linz Electric S.p.A is specialised in the production of alternators from 1.7kVA up to 1500kVA and rotating welders up to 500 amps. The main focus of Linz Electric is the customer's satisfaction through the top product quality, quick and complete service.

## Lister Petter Ltd.

**Long Street**
**Dursley**
**Gloucestershire**
**GL11 4HS**
**United Kingdom**
**Tel: +44 1453 544141**
**Fax: +44 1453 546732**
**Web: www.lister-petter.com**
**E-mail: sales@lister-petter.co.uk**

Lister Petter manufactures a range of diesel powered generators from 2 to 280kVA. These are available open or canopied, 50 and 60Hz, either 1500, 3000, 1800 or 3600rpm and in various voltages. These generators are available in single or three phase configuration and are designed for both standby and prime applications.

## Lovato Electric S.p.A.

**Via Don E. Mazza 12**
**Gorle (BG)**
**24020**
**Italy**
**Tel: +39 035 4282111**
**Fax: +39 035 4282200**
**Web: www.lovatoelectric.com**
**E-mail: info@lovatoelectric.com**

World leader manufacturer of electrochemical and electronic components for genset control panels. Our range includes generator controllers, automatic transfer switch controllers, battery chargers, changeover contactors and switches and more!

## Mahindra & Mahindra Ltd. Mahindra Powerol Business

**Gate No. 2, Powerol Building**
**Akurli Road, Kandivali E**
**Mumbai**
**400101**
**India**
**Tel: +91 22 66483051**
**Web: www.mahindrapowerol.com**
**E-mail: ghosh.joy@mahindra.com**

Mahindra group, the tractor & multi-utility vehicles major in India, forayed into Gensets in 2002. Today, Powerol are powering over 240,000 Gensets in India & in global markets.
Powerol comes with the rating upto 200kVA in global markets.
Mahindra Powerol products are presently available in over 20 Countries across Africa, Middle East & Asia.
Mahindra group in 2011, featured on the Forbes Global 2000 list. In 2010, Mahindra is featured in the Credit Suisse Great Brands of Tomorrow.

**Agents:**

Ghana - Svani Ltd.
Malawi - ETC Agro Tractors & Implements Ltd.
Nigeria - SCOA Nigeria Plc
Rwanda - I Engineering Rwanda Ltd.
Sierra Leone - Esscon Services Ltd.
Tanzania - ETC Agro Tractors & Implements Ltd.
Uganda - ETC Agro Tractors & Implements Ltd.

## MAN Diesel & Turbo SE

**Stadtbach Str 1**
**Augsburg**
**86153**
**Germany**
**Tel: +49 821 3220**
**Fax: +49 821 3221460**
**Web: www.mandieselturbo.com**
**E-mail: powerplant@mandieselturbo.com**

MAN Diesel & Turbo can look back at more than 250 years of industrial history and is the leading provider of large-bore reciprocating engines and turbo machinery for marine and stationary applications. With our fast product range from reciprocating engines running or liquid or gaseous fuels, steam turbines and industrial gas turbines for the energy business, from single engines and generating sets to complete made-to-measure power plants on EPC basis as main contractor MAN Diesel & Turbo is well situated to accommodate this.

**Agents:**

South Africa - MAN Diesel & Turbo South Africa (Pty) Ltd.

## Mantrac Group

**(B-17) Smart Village Km 28**
**Cairo Alexandria Desert Road**
**Giza, 12577, Egypt**
**Tel: +20 2 35314000**
**Fax: +20 2 35370798**
**Web: www.mantracgroup.com**
**E-mail: hdeeb@mantracgroup.com**

Mantrac Group is the authorized Caterpillar dealer, distributing and supporting Caterpillar construction machines, power systems and material-handling equipment in Egypt, Kenya, Tanzania, Uganda, Nigeria, Ghana, Sierra Leone, Iraq and Siberia- Russia. With over 3000 employees and decades of experience as a Caterpillar dealer, we provide customers with comprehensive solutions backed by technical know-how, experience and in-depth knowledge of their local markets.
We supply CAT diesel generators from 250 kVA up to 8000 kVA, olympian fully enclosed generators sets from 8 kVA - 220 kVA, automatic transfer switches, natural gas engines and gensets, CAT marine propulsion engines, marine gensets, power modules.
More than a supplier of generator sets, we specialize in power plant turnkey installations and heat-recovery applications. Our extensive work scope includes engineering, design, testing, installation, on-site commissioning, and training as well as long term service and support.

**Agents:**
Egypt - Mantrac Egypt Ltd.
Ghana - Mantrac Ghana Ltd.
Kenya - Mantrac Kenya Ltd.
Nigeria - Mantrac Nigeria Ltd.
Sierra Leone - Mantrac Sierra Leone Ltd.
Tanzania - Mantrac Tanzania Ltd.
Uganda - Mantrac Uganda Ltd.

## Marelli Motori S.p.A.

**Via Sabbionara 1, Arzignano (VI)**
**36071, Italy**
**Tel: +39 0444 479711**
**Fax: +39 0444 479888**
**Web: www.marellimotori.com**
**E-mail: sales@marellimotori.com**

Marelli Motori S.p.A. is a leading manufacturer of:
- Synchronous generators in low voltage 10 - 5.000kVA and medium/high voltage 500 - 9.000kVA
- Generators for Hydropower application in low, medium and high voltage range up to 6.000kVA (4-22 poles)

Applications include prime, hydro/marine engines and water/gas turbines. The company offers worldwide support.

## Massey Ferguson Power Series

**1 Charlestown Drive, Craigavon**
**Northern Ireland, BT63 5GA**
**United Kingdom**
**Tel: +44 28 38356000**
**Web: www.masseyferguson.com**
**E-mail: sales@mfgen.co.uk**

- 930 9 - 33 kVA Perkins Engine, MeccAlte alternator
- 950 60 - 330 kVA AGCO Power (Sisu) engine, MeccAlte alternator
- 970 300 - 710 kVA Scania engine, MeccAlte alternator
- 990 715 - 3350 kVA MTU engine, MeccAlte and Stamford alternators (to 11kV)

All option including canopies, remote access and synchronising.

## Mecc Alte

**6 Lands End Way**
**Oakham**
**Rutland**
**LE15 6RF**
**United Kingdom**
**Tel: +44 1572 771160**
**Fax: +44 1572 771161**
**Web: www.meccalte.com**
**E-mail: steve.ohara@meccalte.co.uk**

Mecc Alte are proud to be the world's largest independent producer of synchronous alternators ranging from1kVA to 5,000kVA. Quite simply, we manufacture the worlds widest range of LV to MV and HV alternators through 'made for manufacturing' product designs. As a specialised manufacturer of synchronous alternators/welders and special rotating machines within the electromechanical sector, we can produce bespoke equipment to cover a highly diverse range of applications.

**Agents:**
South Africa - Sub Sahara Power Distributors (Pty)

## Mecc Alte International

**Ze La Gagnerie**
**Saint Amant De Boixe**
**16330**
**France**
**Tel: +33 545 397562**
**Fax: +33 545 398820**
**Web: www.meccalte.com**
**E-mail: info@meccalte.fr**

Mecc Alte is a world leading producer and supplier of synchronous alternators. As a totally independent company we are focused totally on producing world class alternators.

## Mikano International Ltd.

**34/35, Acme Road**
**Ogba**
**Ikeja-Lagos**
**Nigeria**
**Tel: +234 700 1234567**
**Fax: +234 1 4602146**
**Web: www.mikano-intl.com**
**E-mail: info@mikano-intl.com**

Mikano International Ltd. was incorporated in January, 1993 to carry out business of manufacturing, sales, maintenance & rental of diesel and gas power generating sets.
Today, Mikano has diversified its business into steel fabrication, electrical & lightings solutions, construction equipment and real construction; identifying with Schneider Electric, ABB, Philips & Raychem.

## Motorenfabrik Hatz GmbH & Co. KG

**Ernst-Hatz-Str. 16**
**Ruhstorf a.d. Rott, 94099**
**Germany**
**Tel: +49 8531 3190**
**Fax: +49 8531 319418**
**Web: www.hatz-diesel.de**
**E-mail: marketing@hatz-diesel.de**

Hatz Diesel is a specialist in 1 to 4 cylinder diesel engines which are used in all manner of applications such as construction machinery, compressors and utility vehicles. Besides, Hatz produces generating sets up to several hundred kVA as well as scalable electricity stations for independent power supply.

**Agents:**
Algeria - Dieselec SARL
Burundi - Metalubia
Cameroon - EMEI Diesel SARL
Cote D'Ivoire - Prestige-Auto
Gabon - MIAG - Matériel Industriel et Automobile Gabonais
Ghana - Agria Machinery Services & Co. Ltd.
Kenya - First Machineries Ltd.
Mali - Dupe SA
Mauritania - Sodeq SA
Morocco - Sonacom
Nigeria - A1 Multi Services Ltd.
Senegal - Mat Force (CRE Technology)
South Africa - Hatz Diesel SA (Pty) Ltd.
Tunisia - S.I.A Ben Djemaa & Cie

## MTU South Africa (Pty) Ltd.

**PO Box 215**
**Milnerton, 7435, South Africa**
**Tel: +27 21 5295760**
**Fax: +27 21 5511970**
**Web: www.mtu-online.co.za**
**E-mail: info@mtu-online.co.za**

MTU Onsite Energy is one of the core brands of Rolls-Royce Power Systems which is a world-leading provider of high and medium speed diesel and gas engines, complete drive systems, distributed energy systems and fuel injection systems for the most demanding requirements.

**Agents:**
Namibia - Namib Diesel CC
Nigeria - Stag Engineering
Zimbabwe - R&S Diesel Pro Services (Pvt) Ltd.

## ORTEA S.p.A.

**Via dei Chiosi 21**
**Cavenago B.za (MB), 20873, Italy**
**Tel: +39 02 95917800**
**Fax: +39 02 95917801**
**Web: www.ortea.com**
**E-mail: ortea@ortea.com**

Founded in 1969, Ortea is now a leading company in manufacturing and engineering voltage stabilizers, magnetic components, automatic power factor correction systems, generating sets and electrical equipments in general. Beside standard production, Ortea is able to be extremely flexible in developing and manufacturing special equipment according to user's specifications, thanks to the experience gained in over 45years.

**Agents:**
Cote D'Ivoire - ORTEA Africa

## Perkins Engines Co. Ltd.

**Frank Perkins Way**
**Peterborough, PE1 5FQ**
**United Kingdom**
**Tel: +44 1733 583000**
**Web: www.perkins.com**

Perkins is a world leading supplier of off-highway diesel and gas engines, offering power up to 2500kVA in diesel or 1000 kWE prime in gas. Our cost effective solutions, from competitive fuel consumption to ease of maintenance, whatever the power requirement, add real value to our customers' equipment.

## PowerLink Machine (UK) Co. Ltd.

**Vickers Building**
**Hurricane Close**
**Sherburn in Elmet, LS25 6PB**
**United Kingdom**
**Tel: +44 1977 689100**
**Fax: +44 1977 681990**
**Web: www.powerlinkworld.com**
**E-mail: info.uk@powerlinkworld.com**

PowerLink UK manufactures diesel generators from 10kVA - 2250kVA, open type and soundproof. We serve the world market through the PowerLink Group, and our worldwide distributor network, focusing on the Middle East, European and African markets. Please contact our dedicated team based in Leeds, United Kindom for more information.

## Powermode

**Unit E2, Cambridge Commercial Park**
**18 Trinity Close**
**Paulshof Ext 45**
**Sandton, 2056**
**South Africa**
**Tel: +27 11 23507750**
**Fax: +27 11 2357777**
**Web: www.powermode.co.za**
**E-mail: power@powermode.co.za**

Powermode is a leading power provisioning specialist. Its Power Engineering Division markets a range of Uninterruptible Power Supply (UPS) and power management systems. It also undertakes backup generator and standby power systems servicing and maintenance. Powermode's Solar Energy Division specialises in the fields of solar power technology, PV inverters and hybrid systems.

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info@teksangenerator.com
www.teksangenerator.com

**Diesel Gensets • Cogen&Trigen Power Packs • Hybrid Power Systems • Portable Gensets**

TEKSAN

## Powersource Projects Ltd.

**PowerPro House, Unit 4**
**Capital Park Industrial Estate**
**Combe Lane**
**Wormley, Godalming, Surrey**
**GU8 5TJ, United Kingdom**
**Tel: +44 1428 687979**
**Fax: +44 1428 687799**
**Web: www.power-source-pro.co.uk**
**E-mail: sales@power-source-pro.co.uk**

PowerPro range of Diesel Generators from 7.5-2000kVA, supported by full range of genuine spare parts for engines, alternators and control systems.

## PR Industrial

**Località il Piano snc**
**Casole d'Elsa, 53031, Italy**
**Tel: +39 0577 965200**
**Web: www.pramac.com**
**E-mail: info@pramac.com**

PRAMAC is an Italy-based company engaged in the manufacturing of the power generation equipment and materials handling equipment. The Company divides its activities into two business sectors: Power Systems e Power Engineering, which comprises generators for electric power, including low voltage portable generators and medium and high voltage generators and similar machineries; Handling, which includes the manufacturing and distribution of the machinery for handling logistic.

## PR Middle East FZE

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**Fax: +971 4 8865276**
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PR Middle East FZE is under PRAMAC group which specialize energy generation solutions - Lighting solution, prime power/standby standard solution, portable solution, rental solution and telecom solution. Product portfolio also includes material handling systems.

## Prime Electric

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**Fax: +91 124 4871698/99**
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## Rolls-Royce PLC

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**Tel: +44 1926 307700**
**Fax: +44 1926 307987**
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Rolls-Royce is a leading supplier of low emission, high efficient Aeroderivative gas turbine power generation packages from 3.8 – 66mw and Bergen reciprocating engines up to 9.4mw. All products are supported by a world class service organisation.

## SAB, Evers & Co. Standard Aggregatebau KG

**Oststrasse 11, Norderstedt**
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**Fax: +49 40 522501144**
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Reputable German manufacturer of diesel-driven generating sets from 50 to 4000 kVA in stationary, transportable or mobile executions for standby, peak load or base load applications world-wide. Main competencies are the planning, designing, manufacturing, installation and servicing of global plant constructions under consideration of individual customer and project requirements.

## Sakr Power Generation

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**Fax: +961 9 445444**
**Web: www.sakr.com**
**E-mail: lebanon@sakr.com**

Sakr Power Generation deals with the world's leading names in Power Generation:

- Mitsubishi, MBH, Cummins, Lister Peter for high speed diesel engines
- GE Transportation for medium speed diesel engines
- Marathon, MBH and Stanford alternators

SPG is among the most reputed solution providers in their segments with a presence across MEA, Africa and Europe.

**Agents:**
Nigeria - Sakr Power Generation Nigeria Ltd.
Sudan - Sakr Power Generation Ltd. Khartoum

## Scania

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**Fax: +46 8 55381037**
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Scania is one of the world's leading manufacturers of trucks and buses for heavy transport applications and of industrial, marine and power generation engines. Employing some 41,000 people, Scania operates in about 100 countries. Research and development activities are concentrated in Sweden, while production takes place in Europe and South America.

## SDMO Industries

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**Fax: +33 2 98416307**
**Web: www.sdmo.com**
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SDMO Industries is one of the world's leading generating sets manufacturers. A wide range of standard products from 1 kVA to several Megawatts through an efficient engineering department meets non-standard requirements. Present in over 150 countries through a dense network, SDMO Industries devotes its energy to supporting you in the successful completion of each of your projects world wide.

**Agents:**
Algeria - SDMO Alger
Egypt - SDMO Cairo
Kenya - SDMO Kenya
Nigeria - SDMO Nigeria Ltd.
South Africa - SDMO South Africa
Togo - SDMO West Africa

## SES SMART Energy Solutions

**Jebel Ali Free Zone**
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**Tel: +971 4 8862066**
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**E-mail: sales@sesrent.com**

SES is a leading turnkey power solutions provider serving temporary and medium term energy needs across middle east, africa and south east asia region.
SES provides rental power solutions including remote and embeded power generation using diesel, gas and hybrid generating sets from 5 to 100 mw at each site running at low, medium and high voltage levels.
The solutions offered include consultancy, design, installation, commissioning, operation, maintenance and demobilization or relocation of the power plants.

**Agents:**
Kenya - SES SMART Energy Solutions
Nigeria - SES SMART Energy Solutions
Rwanda - SES SMART Energy Solutions

## T.W. Generators Ltd.

**Building 12**
**Marsworth Airfield South Site**
**Long Marston Road**
**Marsworth**
**Tring**
**Hertfordshire**
**HP23 4FE**
**United Kingdom**
**Tel: +44 1296 668420**
**Web: www.twgenerators.co.uk**
**E-mail: sales@twgenerators.co.uk**

TW Generators Ltd. has over 40 years experience of supplying and supporting generating sets and associated equipment. New generators are built with European made key components including: Perkins, Volvo, Scania and other makes of diesel engines. A selection of used generators and other used equipment and components are also stocked.

## Teksan Generator

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**Fax: +90 216 3126909**
**Web: www.teksangenerator.com**
**E-mail: info@teksangenerator.com**

Teksan Jenerator is one of the largest manufacturers of diesel, natural gas, generator sets and CHP systems all around the world. Teksan Jenerator has extensive knowledge with skilful staff who concentrate on custom built products in specialised fields. Teksan Jenerator currently supplies power solutions to Africa through appointed dealers.

**Agents:**
Egypt - Mabrouk Brothers
Kenya - Famiar Generating Systems Ltd.

## Visa S.p.A.

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Visa Spa is one of the world's leading gensets supplier, based in Italy, designing and manufacturing diesel gensets, from 9 to 3000kVA, in standard or customized versions for a large variety of applications to meet customers precise requirements(telecommunication, construction, industry,etc..).It is present in over 80 countries through a global network to support in the successful completion of projects through an efficient engineering department, guaranteeing a highly operational flexibility and qualitative standards for which it has become a leader in the market for more than 50 years.

## Volvo Penta

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Volvo Penta is a world leading and global manufacturer of engines and complete power systems for both marine and industrial applications. The Volvo Penta Industrial engine range covers diesel engines for electrical power generation and industrial diesel engines for different stationary and mobile off-road applications. Our engines meet both the most stringent exhaust emission levels, Tier 4/Stage 4, but are also available in lower Tier versions. Volvo Penta has a global coverage with around 4000 dealers in 130 countries.
Volvo Penta is a part of the Volvo Group, one of the world's leading manufacturers of trucks, buses and construction equipment.

**Agents:**
Congo DR - SMT RD Congo
Congo Republic - SMT Congo
Egypt - Orascom Trading Co.
Nigeria - Marine and Land Logistics Ltd.
Nigeria - SMT Nigeria

## Yamuna Cable Accessories Pvt. Ltd.

**3/101, Kaushalya Park**
**Hauz Khas**
**New Delhi**
**110016**
**India**
**Tel: +91 9811022689**
**Fax: +91 11 43577708**
**Web: www.yamunadensons.com**
**E-mail: ravisardana@yamunadensons.com**

- 11 kV to 36 kV cold shrinkable, heat shrinkable terminations and joints
- Vacuum circuit breaker up to 36 kV
- Polymeric insulator for outdoor/indoor switch yards
- Cable accessories for utilities and projects

**Agents:**
Kenya - Subsahara Supplies Ltd.

## Yellogen Ltd.

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**Fax: +44 1430 850002**
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Yellogen Ltd is a specialist supplier of power generation products and carry large stocks of used equipment from 10 to 2000 kVA.
All our used machines are located in the UK Mainland, near York.
We can also provide new Diesel Generators utilising all major engines such as Perkins, Cummins, Volvo, JCB.
To complement our extensive stock we also provide a full range of spare parts for engines, alternators and Control Systems.
We pride ourselves on supplying a prompt, reliable and helpful service at all times and are confident that the quality of our equipment and standard of service is second to none.
For more information, please contact us or visit our website at www.yellogen.com.

## Zest WEG Group-Generator sets

**13 Benbow Avenue**
**Epping Industria 1**
**Cape Town**
**South Africa**
**Tel: +27 21 5077200**
**Fax: +27 21 5077202**
**Web: www.zestweg.com**
**E-mail: gensets@zestweg.com**

Reliable standby power options guaranteed to ensure optimum uptime of any operation are readily available from the Zest WEG group. Previously operating as IMS, one of the oldest and largest genset manufacturers in Cape town, this Zest WEG group division supplies standard off-the-shelf gensets as well as custom-built, application-specific units.

**Agents:**
Ghana - Zest Electric Ghana Ltd.
Zambia - EC Mining Ltd.

# Section Two: Agent

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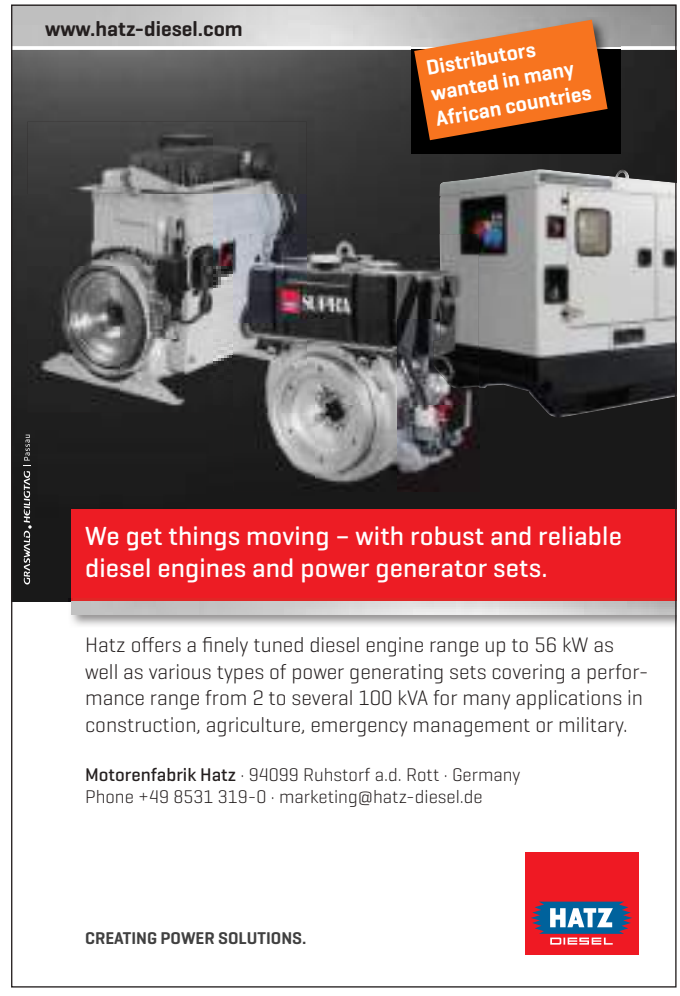

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### Gedeb Engineering PLC
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# A solution for power station maintenance

## Skyriders' provision of quality rope access services to South African utility Eskom

Most power stations are large facilities consisting of boilers, cooling towers and smoke stacks. Safe access to these facilities is a challenge, and scaffolding can be time consuming and expensive to erect. As Skyriders marketing manager Mike Zinn said, "The rope access offered by Skyriders is not reliant on scaffolding, which allows trained technicians to complete tasks much quicker."

Rope access is one of the most efficient ways to carry out maintenance with rapid rigging and de-rigging, as there are not two separate teams needed to construct the rigging and then carry out the maintenance. Zinn said, "The rope technician carries out the work. Rope access also provides the teams with the flexibility needed to complete tasks at various locations quickly."

**Servicing Eskom's structures**

Skyriders has successfully completed recent maintenance work at three of Eskom's power stations, Matimba, Medupi and Tutuka power stations using rope access. The work at Matimba required working at a height of 250m. The steel erection at Medupi made use of rope access as it was a quicker and cheaper alternative to scaffolding. The recent work at Tutuka required industrial vacuum cleaning work on hard-to-reach structures that were inaccessible using scaffolding.

At the Medupi power station, Skyriders was tasked with carrying out maintenance on the station's water treatment plant. The water treatment plant is responsible for processing all of the processed water from the power station, including run-off water and the process water from the plant. This water is treated and pumped back into the system.

"The columns of the Medupi water treatment plant are approximately 6 m high, and by using rope access, the maintenance team was able to get to the top of the columns and complete the necessary work quicker and easier than if they had used scaffolding," Zinn explained.

Skyriders has also carried out various projects at the Matimba power station since 2003. The most recent project required maintenance work on two of the station's stacks. This involved a high pressure wash of the two stacks and the application of acid resistant paint to the top 40m of the 250m high stacks. This project faced several difficulties, but these were successfully overcome by the team of eight highly trained rope access technicians.

**Rope access is one of the most efficient ways to carry out maintenance**

Fly ash debris can be harmful and lead to negative effects on the environment and efficiency of a power station. Zinn recalled, "In November 2013, Skyriders was appointed by Eskom to remove this debris from all inaccessible structures at the Tutuka power station. These structures included; the boiler house, turbine hall, ash handling plant, structural beams, side walls and cable trays."

Skyriders has been carrying out general rope access maintenance and inspection at Tutuka power station since 2005. Although scaffolding has been used in the past, rope access has been proven to be a more efficient means of gaining access to high elevation structures, particularly in the power generation sector. Rope access is also significantly faster and cheaper, as well as more flexible.

**Proficiency in the power sector**

Skyriders has also had a permanent rope access maintenance and inspection team at Kendal for ten years, assisting with various tasks such as boiler internal inspections, inspections of the PF pipes, coal bunkers, terrace bins, precip hoppers and ducting. Zinn reported, "Teams have also carried out maintenance on the roof and side sheeting, bucket elevators, smoke stacks to name a few."

Skyriders offers a variety of rope access aided services to numerous industries, such as power generation, mining, heavy industry and facilities management. These services include non-destructive testing (NDT) and inspection, concrete inspection, maintenance and repairs, application of coating systems, work at height safety systems, welding, and confined space rescue and standby.

Zinn believes that the Skyriders team has proven itself highly skilled and proficient in the power generation sector. Zinn said, "The highlighted successes at Eskom power stations has resulted in the company being contracted for additional work at some of the facilities, and the future outlook for Skyriders remains positive." ■

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# In search of clean, affordable energy

## Viable power generation solutions are essential for the development of West African companies and communities

Nigerians need reliable, affordable, safe, clean energy, but not just any energy at any cost. These are the key words that politicians, development agencies and, increasingly savvy business operators are using. Today, the West African nation's households pay a high poverty penalty. A poor rural household in Nigeria spends about N65–N200 (US$0.33-1.00) on energy per day. How much does one Kilowatt from a diesel-generator cost? How much productive time is lost in Nigeria every day because of black-outs? Whenever the argument is made that solar systems have a higher initial (upfront investment) cost, all these factors are mostly ignored. Where the cost of solar is compared only with the kilowatt hour price of grid electricity, the poverty factor is left out of the equation, thus leaving a distorted picture of the true and affordable price of renewables.

Management and technological improvements are needed to stabilize West Africa's power grid

**Reliable and sustainable?**

People connected to the grid would hardly describe the grid as being reliable. A different approach to the grid is required that combines management and technological improvements to stabilize the grid with renewable energy solutions that can close the gaps. Energy resilience can be enhanced by connecting many smaller units of electricity generation. This requires a shift in investment towards smart mini-grids and energy solutions for individual households. This is especially relevant for those areas that the power lines currently pass by.

Large hydro-power dams, which provide up to 30 per cent of Nigeria's power, long-viewed as the most reliable sources of electricity, are suffering from inadequate maintenance. With climate change their reliability is further undermined, as drought and other extreme weather events affect their installations.

**No single energy size fits all**

Nigeria's electricity market operates at different scales and the most appropriate solutions differ significantly depending on the scale. The pros of a massive ramp up of renewables on- and off-grid are clear:

- Solar PV and wind power are increasingly affordable. Their low cost can help drive grid penetration.
- At scale, renewables are cost competitive. Grid parity has been reached for wind and PV solar, i.e. the cost per Kwh over the lifetime of a project are now lower when compared to fossil fueled power.
- Renewables can lead to reductions in the wholesale price of electricity, if regulation grants it priority grid access.
- Renewables technology is fast to deploy: One-two years for a solar plant, three-five years for a wind park, 20 years or more for a nuclear plant.

The rapid deployment of renewables needs to be managed properly:

- There are in the short-term higher up-fronts costs that need to be borne by the investor, a community or the prosumer (a consumer who also produces electricity that is fed into the grid). These can often be recouped within 2-3 years.
- There is a risk of dumping of sub-standard technologies, like second-hand PV panels.

**Grid service**

With plentiful renewable energy coming into the grid, combined with unbundling and privatisation, earnings in the electricity sector have moved up the value chain. Exploration and production are marginal earners, grid operation is neutral and most profits are being made in energy services. This has attracted many start-ups to the (renewable) energy services market. New services are being provided by incumbent operators as well as new companies (eg from telecoms, banking and electronics). We observe a trend towards selling new services in bundles (solar energy, mobile phone, home automation and Internet). If designed well, an energy services market promotes energy efficiency and demand-side management, thus reducing demand growth and pressure on the grid. ■

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# Volvo L120Gz leaves the competition behind

In a competitor comparison test, the Volvo L120Gz wheel loader was shown to deliver up to 12 per cent greater productivity and fuel efficiency than a well-known competitor in short cycle loading and load and carry applications

The new Volvo G-Series wheel loaders with Z-bar linkage have attracted wide attention from customers in African and Middle Eastern markets since they were first revealed to the press in June 2015. Significant orders for the L60Gz, L90Gz and L120Gz have been placed with dealers in West Africa, Southern Africa, Gulf countries and Russia.

"Volvo wheel loaders are typically designed with a TP linkage, which increases the versatility of the machine by supporting high performance from a wide variety of different attachments," says Masood Akar, regional product manager for wheel loaders at Volvo CE. "In Africa, the Middle East and Russia, however, we noted that a great many of our customers are using wheel loaders for bucket handling applications only. In this case, the increased hydraulic working pressure together with the optimised Volvo-designed Z-bar linkage on the L60Gz, L90Gz and L120Gz provide a high breakout force for digging various materials and, therefore, a high production capacity in bucket handling applications. We listened to the market and designed the new G-Series models accordingly to help customers get the most out of their operations."

The simpler design of the G-Series wheel loaders with Z-bar linkage also enables dealers to put together a more price-sensitive package for customers if required, with different optional equipment, buckets and tires. For instance, Volvo offers two different general purpose (GP) buckets acorrding to customer needs. The heavy-duty GP bucket outdoes competitors not only on innovative design, but also on value for money. The standard GP bucket offers a lightweight, durable, basic specification that matches most competitor GP buckets with regard to wear life.

"There is no doubt that these models are premium machines, with the well-proven Volvo powertrain from Europe delivering the high level of quality and performance that customers expect from the Volvo brand," Akar affirms.

**Face-loading face-off**

With the first shipments only having left the factory in September, the Volvo G-Series wheel loaders with Z-bar linkage have yet to demonstrate to customers their true value on the jobsite. An early indication of their potential, however, was given by a recent competitor comparison test held by Volvo CE and one of its dealers at a customer's limestone quarry in the Middle East. Volvo CE set its L120Gz loader against the nearest competitor model with a Z-bar linkage, which also happens to be one of the most popular wheel loaders in Africa and the Middle East.

"It is important that we understand and quantify how Volvo products shape up against the competition, not only so that we can develop our machines to be the best on the market, but also share hard facts with customers and enable them to make an informed choice," Akar says.

Handling aggregates with an average density of 1,500kg/m3, both the Volvo and its competitor were tested on short cycle loading (face loading Volvo FMX trucks), load and carry operations on flat ground (travelling 100m, dumping and returning), and load and carry operations uphill (travelling 50 out of 90m at a 12-degree incline, dumping and returning). The truck payload was measured using a weighing bridge, loading cycles were timed and the total number of cycles were counted per one hour (60 minute) work shift. Fuel consumption was measured over the shift using a fuel measurement device.

Calculations were then made for fuel efficiency (tons per hour), fuel consumption (litres per hour), productivity (tons per hour), and bucket fill factor (percentage), based on the average results of two experienced operators over the one hour work shift.

**Clear number one**

The Volvo L120Gz scored higher than its main competitor for both productivity and fuel efficiency in each of the three bucket handling scenarios. Productivity-wise, the L120Gz scored nine per cent higher in short cycle loading, eight per cent higher in level loading and carrying, and 12 per cent higher in uphill loading and carrying. The Volvo achieved its greatest fuel efficiency advantage – 12 per cent higher than the competition – in short cycle loading. Long term these figures would add up to major gains in productivity and profitability for the customer.

"One of the main reasons for the Volvo L120Gz wheel loader's overall superior performance is the harmony between the drivetrain, hydraulics and steering system," Akar says. "Operators can lift the bucket with ease while steering, even at low engine speeds, and lift it quicker than the competition, especially when driving and lifting simultaneously – promoting faster cycle times. Meanwhile, the smooth transmission shifts on the L120Gz promote seamless maneouvers with minimal bucket spillage."

The excellent stability of the L120Gz compared to the competition also helped the machine to handle much higher material densities without any problem and the higher dump clearance allowed operators to dump the material quicker into the FMX trucks, which have a body height of 3,000mm, especially with the last bucket.

"The L120Gz used for the test only had 10 operating hours on the clock so as all the drivetrain components settle in we would expect to see even greater fuel efficiency from this machine," Akar explains.

Afterwards the machines' engines were left running to measure how much fuel they consumed when idle. The L120Gz consumed 11 per cent less, which can be attributed to the decades of experience and optimisation built in to the Volvo engine.

**Attention to detail**

Visual comparisons also revealed the Volvo wheel loader's advantages in operator comfort and safety, machine durability and ease of maintenance over the competition. The Volvo cab is more spacious with ergonomically-grouped switches and controls – and the design of the cab posts and larger glazed area give outstanding visibility for better control, safety and operator productivity.

Handrails and anti-slip service platforms all around the machine help to keep the operator safe while competing daily services such as cleaning the window. The cab air filters are located outside the cab and are accessible from ground level, requiring no tools to change them, while all the engine service points are grouped on one side.

The rear axle cradles on the Volvo L120Gz require no maintance at all for increased durability, uptime and lower service costs. Both the front and rear axles feature circulating oil-cooled wet disk brakes, including a break wear indicator pin built into the brake housings. The steering cylinders are well-protected in the machine frame for increased protection and a longer service life – and dual seals have been added to the bucket pins for extended service life of the linkage pins.

"At Volvo we are very proud of the Volvo G-Series loaders with Z-bar linkage – their design and performance – and can't wait to have their quality confirmed by customers in the market," Akar concludes. ■

# Superior sand for competitive concrete

## CDE Global delivers a new mobile sand washing plant to benefit quarrying operations in East Africa

"We are very proud to own CDE Global's first Combo X70 Mobile Washing Plant in Tanzania," said Darpan Pindolia, director of Dar es Salaam-based Estim Construction, one of the largest civil and building companies in East Africa. "Estim Construction builds high-rise buildings so ensuring highest quality, strength and consistency in our concrete production is crucial.

"This new CDE Global installation, which we understand is the most advanced plant of its kind in East Africa, has enabled us to optimise production and maximise our return on investment through consistency in feed rate, with the added bonus of giving us the edge over our competitors."

The CDE Evowash and stockpile at Estim in Tanzania

### Excellence from innovation

A testimony to the growing awareness in the quarrying industry of the multiple benefits of sand washing, the partnership between CDE Global and Estim Construction in Dar es Salaam was a labour of love and an exciting breakthrough in the African market. From humble beginnings 25 years ago in the form of a small truck, Estim Construction have grown to become one of the largest and most respected companies in Eastern and Southern Africa, with headquarters in Dar es Salaam, Tanzania and sister offices in Zambia and Mozambique. Estim Construction's dedication to excellence and innovation mirrors the CDE work ethos, so developing the most efficient sand washing solution was a gratifying process resulting in a product that surpassed Estim Construction's expectations. As the company now enjoys optimised quality and increased productivity, the future looks bright.

At Estim Tanzania, the Evowash and AquaCycle

Communication of initial needs with CDE Global was made easy as the company's South Africa-based business development manager was always available to talk without time zone constraints or for a visit to the customer's site. In-depth conversations followed, based on observations made during site visits, and effective communications with all relevant sections of the company led to the identification of specific requirements and to a unique sand-washing solution to be developed, focusing on Estim Construction's priority of two different sands and maximum recycling of processed water.

### Expertise for customer care

Key to the success of CDE Global is having representatives based at the heart of each region of the world, who understand the specificities of the sand washing sector in their area and can relate to the customer's needs. Its current Johannesburg-based representative has been sharing his expertise

with companies throughout Sub-Saharan Africa for over eight years, providing customer care and expertise to the sand, aggregate and mining industry.

Nicolan Govender, CDE global regional manager for Africa, commented, "A CDE Combo X70, an integrated sand washing and water recycling system which uses 90 per cent less water than traditional sand washing systems, was approved by Estim Construction as their solution of choice. Bespoke additions or modifications were applied to meet their circumstances and requirements.

"To ensure that Estim Construction had complete ownership of their operation, a CDE engineer trained an Estim Construction operator to oversee the installation and take actions based on the changing characteristics of the feed material.

"The plant is fed 50 tons per hour to produce 40 tons per hour of final quality washed sand. Waste and water from the EvoWash report to the AquaCycle high-rate thickener so that up 90 per cent of the water is recycled and reused. The concentrated fines are flushed out, resulting in minimal water replenishing the water tanks."

The new CDE sand washing plant for Estim Construction has now been running for two successful years. Estim Construction's Director Darpan Pindiola concluded, "We could not be happier with the choice we made. Working with CDE Global, and especially their Business Manager and engineers, has been a crucial factor in achieving the best final product. Thanks to our CDE Combo X70 we can now complete orders for various grades of concrete required for rafts, columns and slabs to produce paving blocks and other items in the knowledge that we will always meet our clients' deadlines and produce consistent quality and output throughout the washing process." ■

The Evowash combo at Estim

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# bauma 2016: new developments

## bauma 2016 is fast approaching with a line up of exhibitors set to showcase new developments in construction machinery

**Schauenburg**

The company's expertise in the mining sector has stretched to Africa, with Schauenburg implementing its uraniam classification system on two big mining projects in Nambia. One of these projects is the Langer Heinrich mine in the Namibia Desert, operated by Australian company, Paladin Energy. Schauenburg is using its classification system for improving the outcome of this mine.

"We set this a few years ago we are still very much involved in this. We have another project in Congo for a copper mine so we have a classification system for this mine as well, so these are our big projects in Africa," Ralf Diesing, sales office manager, told African Review.

"We are trying to expand in the mining industry but the sector is suffering. We have to be more competitive, environmental orientated so customers choose our product to improve the financial outcome and the environmental aspects of their project," added Diesing.

**Bobcat**

The new generation of compact loaders, compact excavators, telehandlers and attachments from Bobcat will be showcased at bauma.

"We have three years warranty on all the telescopic with rigid frames are being built in our factory. Doosan machines for Africa are coming out from Korea directly - there is a six tonne wheel excavator that we are launching in the next few weeks as well as two fourteen tonne excavators," said

The T40180 telescopic handler from Bobcat

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CarstenSchmidt, martketing manager at Terex.

"The portable power generators will be at bauma the g400 and g500 for both the European and African markets," he added.

Schmidt told African Review that bauma is a good opportunity for the firm to re-strengthen its brand awareness and knowledge. "It raises the opportunity to talk with dealers and customers, introduce new machines and explain the company's strategy."

Kaeser operating on a construction site

**Kaeser**

Following the positive feedback from the last bauma fair, Kaeser has started developing electric driven compressors. "We are the only manufacturer to have electric driven machines, this could be interesting for industrial compressor dealers when they carry out maintenance work " according to a representative at Kaeser. "When you have electricity available it is the cheapest energy form. "

Kaeser's product range features three different sizes 2.5 cubic metres classes as wells as 3 and 5 cubic metres classes.

On the fairground, Kaeser will showcase a typical export machine for Africa. Speaking about its operations in Africa, the Kaeser representative told African Review that in Johannesburg the firm has its own subsidiary and very successful dealings with Kenya as well and in Tanzania. "We have a dealer for mobile compressors in the Ivory Coast, North – Morocco, Tunisia – we also have dealers," he added.

**Merlo**

With its head office in South Africa, Merlo supplies the African market with engines, specifically to companies building machines or power generators.

"We have engines from 75kba up to 650kba and most of the engines are going to power supply cities or private households," Steffen Klein, sales at Merlo, told African Review.

" Last year we had record sales in engines for power generation and we have a range of engines that are stage 2 certified – not a demand in the African market but we have environmental care as a core value.

Klein added that the company would like to fulfil certain standards to not pollute the environment more than necessary. ■

# Himoinsa's LPG lighting tower

## Himoinsa has designed a new lighting tower, which is fuelled by LPG (Liquefied Petroleum Gas) cylinders

The tower has a total of 384,000 lumens, this new model illuminates up to 32,000 sqm running for 24 hours, meaning three nights of continuous work.

The gas lighting tower features the Yanmar engine model 3GP880GB1PB, which has extra power for auxiliary supply rising to 5kW (50Hz) and 7kW (60Hz). This offers the reduction of pollutant emissions, as well as huge savings in operating and maintenance costs compared to diesel lighting towers.

According to Himoinsa, this lighting tower works best for large events, in cities, or in environmentally sensitive areas. Pollutant gas emissions, both carbon dioxide and noise, are much lower than in diesel lighting towers.

"Just as gas generators sets, this light tower is especially suitable for oil and gas drillings because it allows the gas used as standby supply (propane) in oil wells to power the tower engine that lights up the working area," stated Manuel Aguilera, gas product manager at Himoinsa. The new lighting tower AS4012 LPG features a mast with 360 degrees manual rotation and incorporates four metal halide floodlights of 1000W each.

Himonisa noted that rental companies who want to offer their final users equipment that ensures a reduction in Opex will find the AS4012 LPG model to be a good solution. This is possible not only by reducing fuel costs, but also because operating and maintenance costs decrease significantly, as well as the need for oil change, which is 500 hours over the 200 hours needed by diesel engines. It uses extensible stabilizers to work on uneven surfaces and areas which can easily be affected by high winds.

The new model will be displayed at bauma, Munich, 11th-17 April. ■

The AS4012_LPG Lighting Tower

The latest mining technologies and trends are represented at bauma

# What matters most in mineral extraction

## Today's trending issues in the mining sector, represented at bauma 2016

Since 2004, mining and tunnelling have been an established and increasingly important part of bauma. The mining sector presents numerous innovations and developments at the 2016 bauma trade fair for construction machinery, building material machines, mining machines, construction vehicles and construction equipment held in Munich, Germany in April.

**Setting the standard**

The new Certiq machine monitoring system from Atlas Copco Rock Drills AB is now the standard for the company's construction and mining machines. The Certiq system is based on telematics, such as wireless data transmission. It allows the owners and operators of above and below-ground drilling equipment for example to monitor the performance of their machines at any time and from any location.

With the real-time data available, owners and operators can optimise their machines' equipment to ensure that they achieve maximum productivity and profitability. The Certiq software collects and records a huge amount of data while a machine is operating. These data are then shown on a special web portal in the form of easy-to-understand graphics. Users can easily log on to the portal with their unique login data in order to monitor an individual machine or an entire fleet. The system not only tells users how a machine is currently being used or was used in the past but also gives details of machine availability rates, maintenance requirements and much more. The system even produces performance reports automatically and sends them via e-mail to the owner or operator of the machine.

**Classic models for construction and mining**

Bell Equipment has complemented its E series generation of articulated dump trucks with a total of four new models. With the current Bell B25E and B30E dump trucks, the new mid-range B35E and B40E models and the new B45E and B50E large dump trucks, Bell continues to focus on the "classic" categories and still offers the world's largest 6x6 programme. The Bell B35E and B40E models are following the general market trend with considerably higher nominal loading capacities. Bell Equipment has made the step towards EU4/Tier4 final with new six cylinder engines from Mercedes-Benz optimised by MTU for off-road operations.

Trackman rubber caterpillar tracks from Continental AG help to ensure safe driving in the construction sector. They resemble closed drive belts with a tread profile on which heavy equipment and traction machines such as transporters or roadbuilding machines run. Thanks to the new Armorlug technology, the rubber caterpillar tracks offer even better performance and last longer. A number of layers of material embedded in the drive studs strengthen the material and thus increase its durability. The conveyor belt solutions for the efficient transport of goods are reliable, economical and environmentally friendly, too.

Zetros is a range of HGVs from Daimler AG's Mercedes-Benz brand. They are primarily designed for heavy off-road use. With their conventional bonnet design, they offer very good off-road performance and are low in height. To allow easy maintenance, the engine is accessible without having to tip the driver's cab. The Zetros has a long-bonnet design and is available exclusively with permanent all-wheel drive. Its standard wading depth is 800mm, while 1,190mm is optionally possible. The Zetros features an

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Finalist Bauma 2016

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OM 926 LA six-cylinder diesel engine with a cubic capacity of 7.2l and a power output of 240kW. The drivetrain has permanent all-wheel drive as well as a transfer case with an off-road gear ratio of 1:1.69. The Zetros comes as standard with a nine-speed manual gearbox. However, it is also available with a fully automatic gearbox from Allison.

Construction machines, vehicles and equipment as well as mining machines are the principal applications for engines from Deutz AG. The manufacturer will unveil its newly developed TCD 2.2 diesel and gas engine as well as the established TCD 2.9 in a gas version. With up to 55kW, the TCD 2.2 is a further option for materials handling and compact construction machine applications in particular. Unusually, the engine will be launched in both a diesel and a liquid gas (LPG or fuel gas) version. The gas version will produce 42kW and is an innovation within Deutz's otherwise diesel-driven product range. The TCD 2.2 will go into production in 2019 to coincide with the EU Stage V emissions norm coming into force. All TCD 2.2 and 2.9 models use the same engine platform. This means numerous synergy effects for customers when it comes to integration, for example with regard to connections or the supply of spare parts.

**Handling more materials**

With the LF-21H, GHH Fahrzeuge GmbH is launching a high-performance LHD with a 21t loading capacity. The so-called Efficient Drive System (EDS) was optimised specially for mining applications. The environmentally friendly Deutz engine satisfies the highest EU Stage IV emissions norm, as a result of which the need for underground ventilation is minimised. In addition to the standard version, the LHD is available in various cab versions, thus allowing it to be used even in situations with a roadway height of just 2.5m. A Z linkage designed for ore mining allows the very highest breakout forces and is designed for loading corresponding dump trucks.

The Hazemag Group develops and manufactures machines and other systems for the construction and mining industries. The products and systems are used to prepare and enhance raw materials in the construction industry and to travel underground routes in coal, salt, potash, ore, platinum and diamond mines for example. The Lehigh Cement Company (Heidelberg Cement Group) has ordered a semi-mobile limestone crusher from Hazemag for its Union Bridge site. The system will process up to 2,500t of limestone per hour – with a feed size of up to 2,000mm. The material is discharged from a 400t feed hopper using an HAF 25160 apron feeder. The fines in the feed material are screened at 100mm using an HRS 2638 roller screen.

**Breaking new ground**

Herrenknecht AG supplies tunnelling machines with diameters of 0.10 to 19m for all geologies worldwide. The company also supplies deep drilling rigs and drilling machines for vertical and inclined shafts. One innovation presented at bauma is a slant directional drilling (SDD) rig. Slant directional drilling is an alternative drilling technique which allows shallow, conventional or unconventional oil and gas deposits to be exploited. It is a symbiosis of horizontal (HDD) and vertical directional drilling (VDD). While the entry angle with HDD is between eight and 18 degrees, it is 90 degrees with respect to the earth's surface with VDD. Deposits at low depths for example can be reached quickly using an angle of 30 degrees, while the angle allows a horizontal deflection for further drilling.

Keestrack NV presents the new H4 caterpillar mobile cone crusher (35 to 50t transport weight). At the heart of the model designed for high-quality secondary or tertiary production with a handling capacity of between 120 and 200 t/h is the proven cone crusher technology which was optimised specifically for mobile use. According to Keestrack, the innovative crusher control and monitoring solutions which have a direct influence over the output capacity and product quality are particularly groundbreaking. As the successor to the Galleon range, the Keestrack H4 has a completely new frame design which allows not only high-performance pre- and post-screening equipment but also the use of innovative drive technologies. As a result, the Keestrack H4 is the world's first mobile cone crusher to offer a highly efficient three-deck post-screening module with an oversize material recycler for the production of three high-grade end products in one pass. Keestrack is offering a choice of two economical drive combinations: direct diesel drive of the crusher with electrical or electro-hydraulic peripherals (conveyors, screen units, etc) or the fully hybrid/"plug-in" version with an electrical crusher drive system powered by an on-board diesel generator or mains electricity.

With the Mobicone MCO 11 PRO mobile cone crusher, Kleemann GmbH, a Wirtgen Group company, heralds the launch of its newly-developed PRO Line. It offers quarry operators particularly robust machines for high-performance applications. The machine is driven by a powerful yet economical diesel-electric drive system which allows operation with an external power supply. The cone crusher with a maximum feed capacity of up to 470t/h is equipped with the innovative continuous feed system (CFS), which ensures efficient use of crushing capacity. The MCO 11 PRO is also ideal for use in linked combinations of machines. In addition, the machine can be transported in one piece and can be quickly put into operational position thanks to hydraulic moving machine components.

**More capable machines**

Kögel Trailer GmbH & Co KG presents its new Kögel Multi. This versatile trailer is particularly suitable for transporting building materials and for weather-resistant freight. The platform semi-trailer has a reinforced chassis and a semi-trailer load capacity of 15t to meet the heavy-duty requirements in the construction industry. Depending on the application, the trailer's aluminum walls can be removed. This makes the Multi ideal for transporting various building materials.

Komatsu Mining has developed the new PC7000. Komatsu designed the 677t machine with a view to creating the safest and most efficient large hydraulic excavator in its class. The PC7000 is powered by two 1,250kW diesel engines and is optionally available with an electric drive system. With its 36m$^3$ shovel or backhoe bucket, the PC7000 is designed for use in a range of conditions. The PC7000 is tailored to the 240 to 290t 830E and 860E dump trucks from Komatsu. Drivers will notice the machine's improved control system. After all, Komatsu has optimised both the shovel design and the hydraulic system. As a result, the machine can swing around more quickly and the shovel can penetrate the material more easily.

Liebherr-International Deutschland GmbH launches the Liebherr PR 776, the first infinitely-variable hydrostatically-powered crawler tractor in the 70-ton category. Designed for the most demanding mining and quarrying applications, it is powered by a Liebherr twelve-cylinder diesel engine with a maximum power of 565kW. It has a maximum operating weight of 74t and can be equipped with blades with a capacity of 18m$^3$ (semi-U blade) or 22m$^3$ (U blade). Thanks to its modern drive concept, the new PR 776 crawler tractor is extremely economical. The infinitely variable hydrostatic drive system which is used in all Liebherr crawler tractors is an innovation in this class of machines. Another advantage of the modern drive concept is the needs-based feed pressure supply. If, for example, the full feed pressure supply is not required during operation, this is automatically returned. ■

# Dealing with dust

Governments, mining houses and trade unions are working together to eliminate industry fatalities by 2020, following amendments to Chapter 16 of the Mine Health and Safety Act Regulations agreed to by all parties in late-2014 at the Mine Health and Safety Tripartite Summit. All parties that attended the Summit have prioritised the health and safety of workers, as well as the mining sector's moral obligation to do all that is possible to achieve 'Zero Harm' status.

Numerous safety aspects have been under critical review, including the minimisation of dust exposure through enhanced suppression solutions. According to I-CAT Environmental Solutions non-executive director Professor Jan du Plessis, both underground and open-cast mining operations are proactively seeking new methods of ensuring that they not only maximise worker and community wellbeing, but also minimise pollution levels.

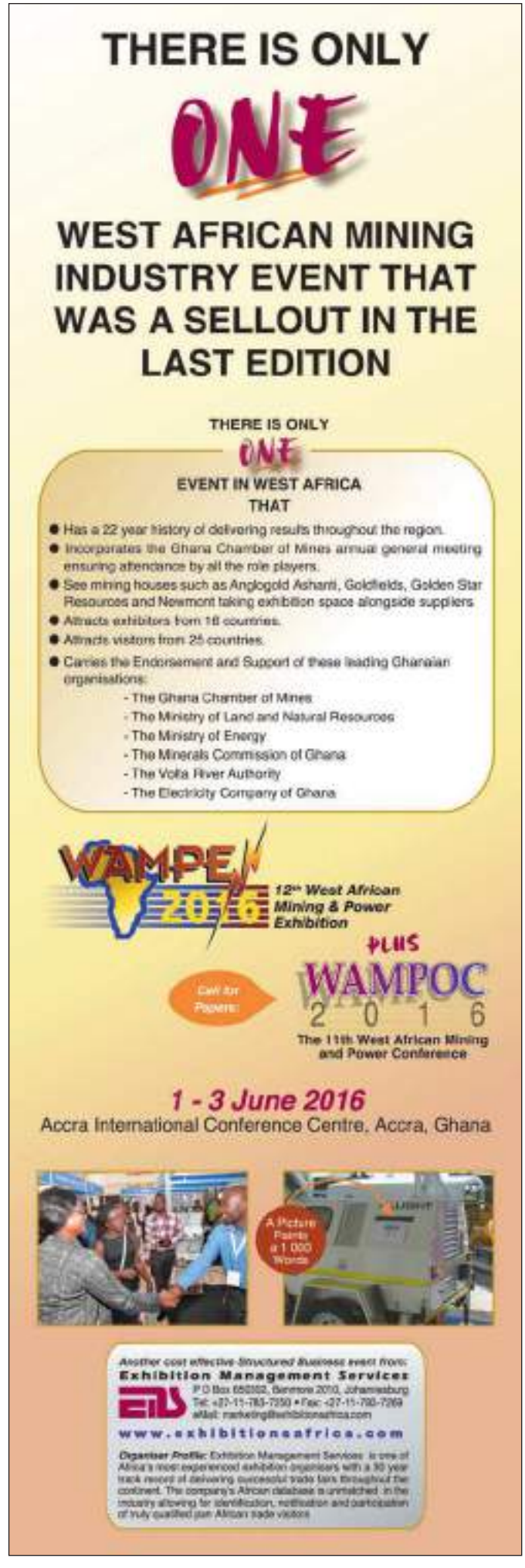
"Poor dust control negatively affects the health and safety of all employees and the quality of life for surrounding communities. It also negatively affects production and operating costs of all onsite vehicles and machinery, thereby impacting on the bottom line of the operation in the long-run. Using water only as a control measure is not only a waste of this precious resource, but over-wetting of inclines and haulage roads also raises safety risks with regards to vehicle control," Professor Jan du Plessis commented.

The dustmonster boasts a throw of more than 100m

By using a dust palliative such as RDC 20, GreenGrip and GreenBit, the frequency of applications can be dramatically reduced, in addition to the service intervals of the ventilation systems and associated equipment. RDC 20 is a water soluble anionic polyelectrolyte polymer that is exclusively developed by I-CAT for use on temporary roads.

It is an innovative formulation of blended emulsified co-polymers and ionic modifiers. When sprayed onto the road surface, RDC 20 forms a durable cross linked matrix. The matrix binds fine soil particles into larger heavier particles, which are less prone to become airborne. RDC 20 is used on temporary roads, as it is a cost efficient means to improve road and dust conditions exponentially.

GreenGrip is a natural polymer based gravel road sealant. I-CAT operations director Anton van der Merwe said, "It is an environmentally safe alternative to chemically based products for semi-permanent gravel roads on mines and residential areas. The solution produces a durable, smooth and dust free surface with fewer maintenance intervals. For permanent dust roads, I-CAT offers a bitumen-based dust suppression solution called GreenBit." ■



# Engineering

## Technical publications now at GWP's new web shop

Every year the **Global Water Partnership** (GWP) Technical Committee produces a number of resources on integrated water resources management – such as background papers, policy briefs, perspectives papers, and technical focus papers. Additionally, GWP publishes a range of publications in collaboration with its partners.

Throughout 20 years of action, the GWP's knowledge resources have continued to grow and a wide selection of knowledge products are available online.

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All of GWP's publications can be downloaded, but many of them are also published in hard copies and these can be ordered now through the GWP web shop, which has been developed in partnership with **Elanders Sweden AB.** This online store features search and browse functionality, and publications can be located by language of publication and by type of publication. Click on the + sign next to the publication/s you want to add to the shopping cart. To proceed to check-out, click on the cart where you will see your complete order. You will be asked for your address details when you click the check-out button. Everything is free of charge.

## Training tomorrow's engineers

The African continent is at the heart of an unprecedented dynamic. With an average economic growth rate of more than five per cent over the last decade, Africa stands against clichés and has become a major stakeholder in the global economy.

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2iE's graduates benefit from the expertise of the contact and service platform Technopole to launch their innovative and ecological business projects. Supporting innovation in Africa, Technopole connects 2iE with the private sector, research and the academic world. The entrepreneurial-engineers training device is made up of a training cycle for all 2iE's technical and managerial sciences, a technological incubator and a business nursery, supported by research means and 2iE's partner network in water and environmental engineering.

## Intergraph SmartPlant solutions improve Eskom designs

South African electricity public utility **Eskom Holdings Ltd** is broadening the use of **Intergraph** SmartPlant solutions to improve its engineering design and maintenance capabilities. The extended five-year contract adds SmartPlant Fusion, SmartPlant Isometrics, Intergraph Smart Data Validator, and hosted licenses for its external contractors to Eskom's engineering solution portfolio.

With more than five million customers, Eskom generates, transmits, and distributes electricity to industrial, mining, commercial, agricultural, redistributors, and residential customers and produces 95 per cent of South Africa's electricity.

Eskom uses Intergraph SmartPlant Enterprise as one of its in-house standards for engineering design, information management and plant engineering.

Intergraph solutions are currently used in ongoing greenfield, brownfield, and operations and maintenance activities, on the following power stations: Medupi, Matimba, Tutuka and Kriel. In the near future, the solution will be deployed to 14 sites.

The future potential benefits provided by the software include improved design quality, more efficient project and plant change management, as well as improved auditability and traceability. Eskom has successfully collaborated on the Fabric Filter design with an external designer using the interoperability capabilities of the software suite.

Commenting on the decision to broaden the use of Intergraph tools, Eskom's Grace Olukune, chief engineer, group technology/GX plant engineering/systems integration, said, "We have become familiar with the capability of the software. We believe that with the deployment of SmartPlant Enterprise solutions, we are getting closer to our vision of having our engineering information easily and universally available."

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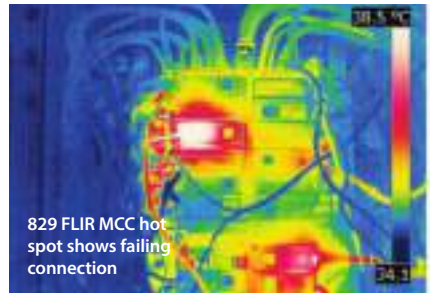
# Building

## FLIR Systems' premium HD handheld thermal camera

Sensor systems manufacturer **FLIR Systems** has released the FLIR T1020, also known as the FLIR T1K, a premium thermal camera for use in a multitude of industrial and building diagnostics applications. The T1K is a high definition (HD) handheld instrument featuring exceptional measurement performance, outstanding image clarity, and a highly-responsive user-interface. The T1K allows users to find hot spots quickly, measure them precisely, and streamline their entire work process.



829 FLIR MCC hot spot shows failing connection

829 FLIT TK1 thermal imaging camera

The T1K features outstanding image quality due to the 1024 x 768-pixel uncooled infrared detector that offers twice the sensitivity of the industry standard for uncooled sensors. This resolution is further boosted by the addition of FLIR Vision Processing, which combines FLIR's unique UltraMax super resolution process with FLIR's patented MSX image enhancement software that overlays important visual details and perspective, such as numbers and labels, over the full resolution thermal image.

HD imaging requires high precision optics and the T1K's lenses deliver best-in-class performance. The T1K features FLIR's OSX Precision HDIR optics, which deliver superior image quality and range performance and allow for accurate temperature measurements from twice as far away compared to the industry-standard lenses. The T1K also features a new focusing system that offers continuous autofocus as well as a dynamic manual focus.

"With the T1K, FLIR has once again raised the bar in the premium thermography segment," said Andy Teich, president and CEO of FLIR. "Making that happen required designing a line of truly superb HD optics and developing our most precise temperature sensors ever."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# Material Handling

## Hartl showcases bucket crusher and screener range at bauma

On show at bauma 2016, the new bucket crusher from **Hartl** stands out for its capacity for high throughput and for the optimal shape of the produced end-material. The unique quattro movement of the jaw crusher, fitted with an up-thrust toggle system, provides and guaranties an overall performance, regarded as second to none.

Amongst the most important advantages is that the material is cracked in the upper area of the jaw crusher. This means bigger blocks can be taken and are crushed in a downward direction into the chamber – compared to the industry standard down-thrust toggle jaw crushers.

Hartl stands for high throughput and optimal end-material shape

The special motion (like a figure eight) gives the crusher a better throughput profile in the middle area and a kind of secondary crushing in the lower area, providing an excellent cubical shape to the end material.

Independent screen analyses confirm Hartl a bad shape content of only six per cent, which means that all global regulations and quality standards are fulfilled with only one time crushing! Beside this, only premium components like SKF bearings, Parker hydraulic and central lubrication system, SAE hydraulic connections, etc are built in.

Hardox steel is standard. Constant quality control during all manufacturing steps grant for highest manufacturing standards.

All finished products are obliged to go on a two hour test run on a special designed test rig where bearing temperature, oil flow, greasing, vibrations etc. are measured. Only after this procedure the products are allowed to leave the factory and be delivered to customers.

The bucket screener from Hartl features a strong and robust design, which makes it suitable for the hardest applications in prescreening as well as final separation. The absolute win in the design is the wide entry area with the optimised storage possibility for maximum load volumes. Material can be stored and with short moves constantly feed into the screener drum.

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# A successful energy audit for SPP Pumps in Egypt

**SPP Pumps MENA LLC** has been highly successful in securing orders for its value-added products and services. Recently, the company responded to an important order from **Lehaa Group**, a private agricultural sectorinvestor, when it completed an energy audit on the irrigation pumping equipment at the Lehaa's farm at Toshka in Egypt. There were a number of significant challenges, especially with respect to the intake pumping system, because of the complexity of the site. However, SPP MENA conducted an extensive energy audit of the existing system.

The data obtained from the audit was compiled and analysed - and then energy-efficient pumping solutions were recommended by SPP MENA. The detailed presentation, given to the Lehaa's management, was appreciated.

The customer was happy to see a significant reduction in energy expenditure once the new system, recommended by SPP MENA, was implemented.

**Impact of the project**

Value-added services like energy audits support SPP MENA's esteemed customers in understanding the operational efficiency of existing system and in appreciating the benefits of implementing energy-efficient pumping solutions. The Lehaa Group was pleased to accept and implement SPP's recommendation.

**More successful business**

In addition to this achievement, SPP MENA also received prestigious orders for the supply of large mixed flow pump sets for irrigation projects and process pumps for the salt & mineral industry. Moreover, the company has successfully executed assembly, testing and packaging of UL-listed fire-fighting pump sets, both engine driven and motor driven pumping units with controllers and allied accessories. SPP MENA supplied horizontal split casing pumping units for a HVAC project in Egypt.

Lehaa Group called on SPP Pumps MENA LLC to conduct an energy audit and recommend solutions to improve its operational efficiency

# Simpler condition monitoring of mechanical components with Siemens

**Siemens** has developed the Siplus CMS1200 Condition Monitoring System to monitor mechanical components. It is an expansion module for the S7-1200 controller that is based on the SM 1281 Condition Monitoring Module. The user creates an efficient monitoring system by combining up to seven SM 1281 modules, to each of which four vibration acceleration sensors and one speed measurement sensor can be connected. This system can be used for continuous monitoring of mechanical components such as motors, generators, pumps and fans. When Siplus CMS1200 is used for predictive maintenance, significant changes as a result of wear, for example, can consequently be detected at an early stage, enabling maintenance activities to be better planned and carried out on schedule.

By means of the TIA (Totally Integrated Automation) portal engineering framework, the Siplus CMS1200 Condition Monitoring System is readily integrated into an automation group containing HMI (human machine interface) devices, controls and motion control components. The recorded signals are easily evaluated with the CMS analytical software on the SM 1281 modules, or archived with a time stamp in the 800MB memory for further analysis. Trend values, raw data, frequency ranges and messages can be recorded.

Siemens has developed the Siplus CMS1200 Condition Monitoring System to monitor mechanical components

The versatile analytical capabilities of Siplus CMS1200 range from parameter-based, frequency-selective analyses, through trend analyses, to monitoring the limits of frequency ranges. The fingerprint comparison makes it easy to localise damage. The parameter-based diagnostics run directly on the S7-1200 CPU for easy monitoring. These diagnostics are performed directly on the SM 1281 module and can be accessed by web browser to avoid the production cycle being burdened by detailed, frequency-selective diagnostics.

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