

FEATURES:

- Control systems + automation
- Drives, motors + switchgear
- Energy management + energy efficiency
- Measurement + instrumentation
- Safety of plant, equipment + people



01-02/2025

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 IO-Link



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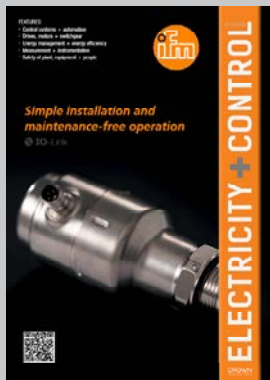
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Driving efficiency and sustainability





In various food and beverage industry applications, where tank levels must be monitored with speed and accuracy, the new LW2720 radar sensor from ifm offers numerous advantages.

(Read more on page 3.)

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SA's G20 presidency opens a year of opportunities

Well, here we are in 2025. I trust that, as you read this, you feel invigorated and recharged – ready for yet another extraordinarily exciting year, as we have come to expect. Indeed, we live in interesting times.

But there is work to be done and there are opportunities to be mastered.

Recognising that *Electricity+Control* is read well beyond the boundaries of this country, I do nonetheless believe it is important to reflect on South Africa's presidency of the G20 in 2025.

There are a few things worth noting. Firstly, it is evident that the objective is to develop a growing awareness of Africa and the Global South – the challenges and opportunities.

This is to be encouraged and supported.

Secondly, there is little doubt that South Africa's presidency of the G20 will draw influential people into the subcontinental region – cities, provinces, countries – and, by extension the region, over the full course of the year.

This is not a world cup, with folk flooding in for a short time, and flooding out. This is an 'event' that runs its course over a long time.

It therefore seems evident that this also poses an opportunity for many ordinary folk – ordinary industries, factories and professions – to shine and be heard. The extent of the interest of the G20 seems inordinately wide and must surely serve as a moment to cement relationships and show what can be done.

It also strikes me that being elevated to a position of international leadership tends to moderate views and intentions – and deepen understanding across various boundaries.

I am hopeful that this is the case.

Ian

Ian Jandrell

PrEng IntPE(SA), BSc(Eng) GDE PhD,
FSAAE FSAIEE SMIEEE

Incidentally, as we watch world politics take some remarkable turns, often in areas we'd least expect, let us never forget that, aside from all the angst we feel, in this country we have seen a political party that has ruled since 1994, accept an election result and work with its opponents. We should not take this for granted. Even among some major players in the G20, this does not happen easily.

The subcontinental region particularly is bristling with opportunity, provided the law makers can establish the playing fields that will allow prosperity to grow. To some extent the establishment of the President's Economic Growth Team to coincide with the presidency of the G20 speaks to this.

The G20 is an important space to lead discussion and policy for a world that is fairer, not stacked in the interests of the powerful nations, and for ordinary folk like us, this means we need to look out for the gaps, get our plants running smoothly, up to spec, and ready for business.

May I wish you, your organisations, your colleagues and your families a 2025 filled with hope, excitement – and real growth and development.



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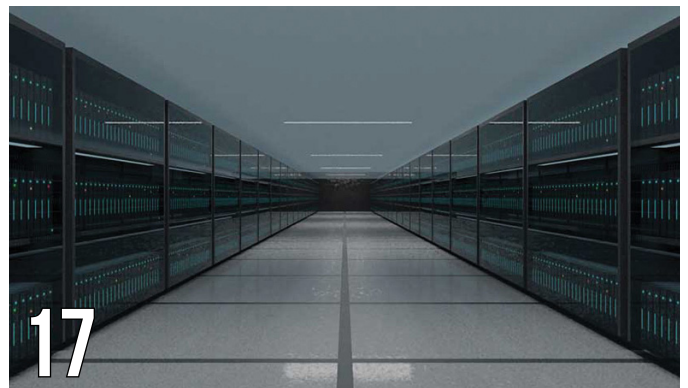
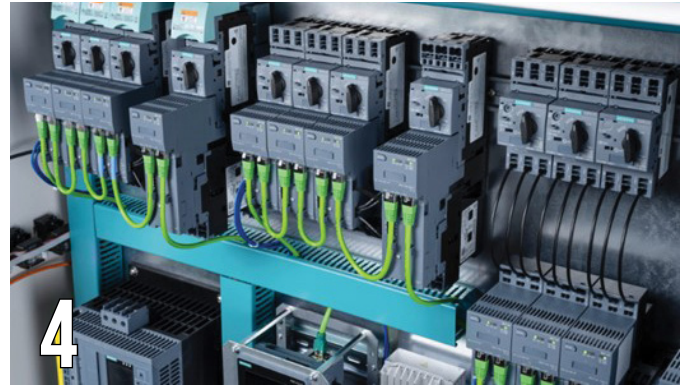
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Locally manufactured solutions for infrastructure development

Non-contact level measurement for hygienic applications

The radar level sensor LW2720 from ifm sets new benchmarks for speed and accuracy. Starting with installation in record time: a standard M12 cable, fast parameter setting using IO-Link and a large selection of adapters enable a simple and customised out of the box start-up.

When used in tanks that can be as high as 10 metres, for example, the LW2720 sensor provides precise level detection even in the presence of agitators or spray balls. Additionally, it remains unaffected by changing media properties. High-speed filling or emptying of tanks are also registered by the radar sensor thanks to the 80 GHz technology – fast, with high precision and without blind zones.

In various food and beverage industry applications, tank levels must be monitored with speed and accuracy. The new LW2720 radar sensor offers numerous advantages for these applications. What is more, it is the first radar sensor for food applications that can communicate via IO-Link.

Whether it's in the production of beer, orange juice, soya sauce, or many other foods and beverages – a large number of products or intermediates are stored in tanks. To control the process in the best possible way, continuous level measurement is usually required. With the new LW2720 radar sensor, this measurement can be carried out reliably and precisely without the sensor having to come into contact with the medium.

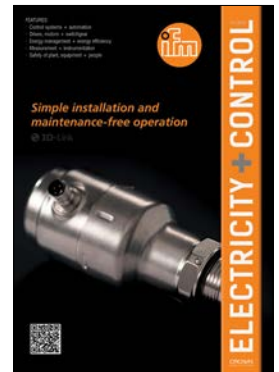
The sensor is installed on the top of the tank and measures the distance to the medium surface via the reflected signal. The volume

of the content in the tank can then be calculated easily based on the level. Due to the radar sensor operating with a measuring frequency of 80 GHz, the antenna is relatively small. The measuring range is 10 metres, with an accuracy of ± 2 mm.

The new radar sensor has been developed by ifm especially for hygienic environments, making it the ideal choice for food industry applications, among others. Featuring a stainless steel housing, food grade antenna and seals, the sensor complies with strict hygiene requirements according to 3-A and EHEDG.

The new sensor is also suitable for the CIP and SIP processes which are frequently used in the food industry.

The measured value can be transferred by the LW2720 either via a conventional 4...20 mA interface or via IO-Link. The IO-Link interface provides further benefits, such as easy parameter setting of the sensor. And if the sensor needs to be replaced, the parameter setting can be directly retransmitted from the IO-Link master, allowing measurement to resume after only a brief interruption. Together with an IO-Link Bluetooth adapter and the moneo|blue app from ifm, the parameters of the LW2720 can also be set directly on site using a smartphone. □



Used in tanks that can be up to 10 metres high, for example, the LW2720 sensor provides precise level detection.



The new LW2720 radar sensor complies with the standards commonly applicable for use in hygienic applications.

For more information contact ifm South Africa.

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Visit: <http://www.ifm.com>

Next generation PLC technology

With the introduction of TwinCAT PLC++, Beckhoff is enabling a performance leap in automation technology. Engineering and runtime can be accelerated, and the well-known TwinCAT advantages of consistent integration, compatibility, and openness continue to be delivered. In combination with easy switchover and the retention of existing TwinCAT functionality, TwinCAT PLC++ offers significant added value – the ‘plus plus’ for the user.

TwinCAT PLC++ is a completely new development from Beckhoff that integrates into the existing TwinCAT ecosystem. It is also based on the languages described in IEC 61131-3. Due to aspects such as the modern compiler technology and the new architecture used, a significant leap in engineering and runtime performance can be achieved. Familiar and proven features have been retained, while key components of the development environment – such as editors



As the new generation of PLC technology, TwinCAT PLC++ offers a significant step up in engineering and runtime performance.

and compilers – have been redeveloped based on IT models. Beckhoff has also placed particular emphasis on the possibility of using DevOps principles to implement continuous integration and continuous deployment, focusing on the specific needs of users.

With regard to runtime, TwinCAT PLC++ offers significant performance advantages. Compared to the previous TwinCAT PLC, the same control code can be executed up to 1.5 times as fast during runtime with TwinCAT PLC++. As a highlight, the new compiler makes it possible to further optimise this control code in terms of execution time. This option – already familiar from the IT world – leads to a further significant increase in execution speed. This means an industrial PC with less computing power may be sufficient for the previous machine control system, so reducing hardware costs. If the hardware platform remains unchanged, the freed-up computer resources can be used to implement more control functionality or to increase the productivity of the machine by minimising cycle times.

From an engineering perspective, TwinCAT PLC++ enables shorter throughput times from control development and commissioning through the entire machine life cycle. This is achieved by reducing operating times based on shorter project loading times and an improved translation process. The minimised project lead times significantly reduce costs and allow for new machines and systems to be launched more quickly.

For more information visit: www.beckhoff.com

Intelligent link module to boost data transparency

As part of its Totally Integrated Automation (TIA) concept, Siemens has introduced the SIRIUS 3RC7 intelligent link module, which offers a quick and easy way to gain complete data transparency down to the field level. The plug-and-play expansion module combines information technology (IT) and operational technology (OT) with minimal installation and commissioning effort. This means the data available at the load feeders can be used efficiently. The SIRIUS 3RC7 intelligent link modules can be integrated seamlessly into the existing automation environment. SIRIUS 3RC7 is part of the SIRIUS modular system, the comprehensive portfolio for industrial controls.

“Transparency down to field level is becoming increasingly important. However, many devices are not connected to the automation system, which means important data is missing. By digitalising the field level, we are creating a new dimension of transparency and enabling data-driven decisions,” said Andreas Matthé, CEO of Electrical Products at Siemens Smart Infrastructure.

Various load feeder parameters can be collected and evaluated directly, including voltage, current, phase imbalance, number of overload trips, and much more. The integrated diagnostic functions help detect and correct faults more quickly. Among other things, the data can be used for Senseye Predictive Maintenance, Siemens’ comprehensive solution for predictive maintenance. It uses artificial intelligence – to examine current fluctuations for anomalies that indicate a defect, for example.

This significantly increases planning reliability for maintenance,



SIRIUS 3RC7 intelligent link modules in the cabinet.

availability, and cost-effectiveness of the system.

With full integration into TIA, users receive up-to-date status information in their operating software. In addition, when using special apps such as Node-RED, they have access to a dashboard that enables them to identify bottlenecks quickly. This helps to prevent downtime and increase the availability of the system.

The SIRIUS 3RC7 intelligent link modules integrate readily into the compact SIMATIC ET 200SP I/O system as well as any other common automation system. Up to 16 load feeders can be connected per BA-Send module bus adapter, in order to benefit from the simple commissioning, individual scalability, and maximum flexibility offered by the SIMATIC ET 200SP.

For more information visit: www.siemens.com

Automation products for more efficient processes



RS now offers an expanded portfolio of automation products for diverse industries.

As automation continues to revolutionise production facilities, RS PRO, the trusted own brand of RS, is expanding its product range to meet the growing demand for smarter, more efficient processes. With over 1 300 new products across more than 15 technologies, RS PRO aims to become the go-to partner for automation solutions.

Adding to its existing range of over 45 000 products, these new products ensure that customers have access to a broader

selection of components at competitive prices, helping them streamline automated operations with ease.

The RS PRO range extends from control systems to mechanical components, as well as essential test and measurement tools to support optimal performance on production lines. The newly expanded portfolio features PLCs, relays, HMI displays, DIN rails, structural systems, pneumatic hoses, fasteners and fixings, bearings, and more, providing a one-stop solution for a wide variety of automation and maintenance needs.

The expanded automation range is designed to serve diverse industries, including discrete and process manufacturing, energy and utilities, and facilities and intralogistics. RS PRO is committed to delivering products that address specific customer needs, tailored to their sector requirements.

In the evolving industrial environment, RS PRO's commitment to quality, reliability, and choice ensures that customers can meet their design, performance, and compliance goals through the duration of the product lifecycle.

For more information visit: www.rsonline.co.za.

Revolutionising TIG welding for aerospace manufacturing

Yaskawa Southern Africa is working with Aerosud Aviation, a leading aerospace manufacturer and an internationally recognised supplier of aircraft interior systems, to implement a cutting-edge robotic TIG welding solution tailored to the exacting demands of aerospace production. The collaboration, demonstrating the two companies' commitment to innovation, precision, and efficiency, will strengthen Aerosud's production capabilities and ensure compliance with stringent original equipment manufacturer (OEM) standards.

The project is led by Yaskawa National Project Manager Devon Prinsloo and Aerosud Welding Engineer Nico du Toit and demonstrates the potential of automation and robotics to transform aerospace manufacturing.

Nico du Toit explains that Aerosud needed to scale up the production of aluminium track cans for Airbus A320 aircraft and this was a key driver for the project. "Airbus is ramping up production on its Single Aisle aircraft, requiring us, as a single-source supplier, to increase throughput," says du Toit. "This welding robot solution enables us to produce uniform welds repeatedly on 1.4 mm to 1.6 mm aluminium and to meet OEM specifications with the highest efficiency."

The TIG welding process, chosen for its quality and precision, delivers clean, consistent welds with minimal distortion, essential for aerospace components. The solution integrates Yaskawa's high-precision robotic arms, Fronius TIG welding systems, and a Servo-Robot Micro-Trac camera system, to ensure accurate seam tracking and filler wire positioning.

Devon Prinsloo highlights that, "The camera scans the weld seam before welding, enabling precise alignment. This ensures repeatability and reduces waste by minimising errors.

"Automation in TIG welding enhances safety, precision, and efficiency, all critical factors in aerospace manufacturing," he adds. Yaskawa's expertise in robotics and software was

instrumental in overcoming the complexities of aerospace welding. Using MotoSim simulation software, the welding process was planned in detail, to reduce potential programming errors and setup time. Additionally, the customised solutions developed by Yaskawa addressed challenges such as variable component geometries and maintaining consistency across diverse materials.

The impact on Aerosud's operations has been significant. "The new technology improves workflow efficiency by reducing the need for rework and increasing yield," notes du Toit. "Automation allows us to maintain consistent quality and scale up production at the same time. This positions Aerosud as a competitive, innovative supplier in the global aerospace market."

The project illustrates Yaskawa's commitment to its mission to push the boundaries of automation technology. "This collaboration reflects our dedication to developing solutions that address the most complex manufacturing demands," says Prinsloo. "Aerospace manufacturing requires precision and reliability, and Yaskawa is proud to contribute to Aerosud's growth and innovation." □



Yaskawa Southern Africa and Aerosud worked together to develop a robotic solution that speeds up production of components for the aerospace industry.

Cybersecurity from the edge to the enterprise

Stratus Technologies leverages the reliability of its high availability/fault tolerant (HA/FT) platforms and collaborates with trusted cybersecurity partners to deliver cybersecurity solutions that work seamlessly with IT and OT workloads, enabling customers to deploy the most suitable cybersecurity tools on a unified platform. It supports customers in integrating edge devices with existing industrial systems, to ensure robust cybersecurity with minimal operational disruption. Stratus offers:

- Proven methodologies for conducting comprehensive risk assessments tailored to edge devices
- Best practices for secure configuration, noting the critical role of regular maintenance, updates, and patches in mitigating vulnerabilities
- Effective strategies for network segmentation to isolate edge devices, reducing the risk of breaches and boosting system resilience

Pre-validated solutions

Stratus platforms provide the fault tolerant reliability required by OT applications with the flexibility, open standards, and manageability required by IT teams. This unified approach ensures robust protection of OT applications and allows IT teams to extend their cybersecurity protection to the edge, using their standard toolsets to deploy and support both OT and IT workloads at scale. Using these pre-validated solutions, organisations can implement comprehensive cybersecurity across the entire infrastructure, protecting environments and meeting regulatory requirements at the edge or enterprise.

Addressing evolving challenges

In the constantly changing cybersecurity environment, organisations encounter numerous challenges that require innovative solutions and strategies. Some of the most pressing issues to be addressed are outlined below.

- Variable threats: Cyber threats are constantly evolving, with an expanding attack surface and increasingly sophisticated techniques used by attackers to breach IT and OT systems. Threat actors may include nation-states, cybercriminal groups, hacktivists, and insiders, each with their own motivations and capabilities.
- Limits of legacy devices/equipment: OT systems often rely on outdated, legacy technologies not designed with cybersecurity in mind. These systems often lack built-in security features and are difficult to update or replace, leaving organisations vulnerable to cyber threats and operational disruptions.
- Integration of IT and OT: As IT and OT systems become more interconnected, they create complex networks that span traditional boundaries. This interconnectedness increases the attack surface and complicates the management and security of the entire ecosystem.
- Edge deployment: Installing cybersecurity solutions in remote or understaffed environments is challenging. Issues arise relating to

enabling reliable physical access, consistent power and network connectivity, and the ability to address technical issues and hardware failures promptly.

- Resources and cost: Enterprise deployment requires significant compute resources and can be costly due to the need for continuous monitoring, real-time data analysis, and sophisticated algorithms and hardware used to detect and mitigate advanced threats across diverse IT infrastructures.

Simplifying deployment

Remaining solution-agnostic, Stratus offers customers flexibility and choice. Its interoperable high availability and fault tolerant platforms support a broad spectrum of cybersecurity tools and applications, allowing organisations to tailor strategies to meet specific needs and preferences.

By leveraging the NIST Cybersecurity Framework (developed by the USA based National Institute of Standards and Technology) organisations can plan, assess, and enhance their cybersecurity capabilities. Stratus' open computing platforms enable organisations to deploy a comprehensive suite of cybersecurity solutions to identify, protect, detect, respond, recover, and govern effectively.

Computing platforms

Stratus significantly enhances cybersecurity deployments by delivering zero-touch edge computing platforms that are easy to deploy and maintain, addressing the complexities of modern IT and OT environments and protecting against interruptions and cyber threats, ensuring robust, autonomous cybersecurity.

Running virtualisation on Stratus platforms enables organisations to consolidate multiple applications, including cybersecurity, onto a single HA/FT platform. This integration with critical applications like HMI, SCADA, historians, and other IT/OT software across various applications and industries provides effective protection without operational disruptions. □



Stratus Technologies collaborates with trusted cybersecurity partners to deliver cybersecurity solutions that operate with IT and OT workloads.

CIV ratings for electric motors warrant attention



Adrian van Wyk,
Managing Director,
Referro Systems.

As most technical industries increasingly rely on advanced motor control technologies, understanding Corona Inception Voltage (CIV) ratings and selecting motors with appropriate CIV ratings are important, to prevent costly failures and downtime during the course of operations. Here, Adrian van Wyk, Managing Director of Referro Systems, explains CIV ratings, what they mean, and how testing and simulation can guide customers to select the right motor for any given application.

Corona is a luminous discharge phenomenon, which is induced by the partial ionisation of air around the conductor when the surface electric field strength exceeds a critical value. This needs to be monitored closely, especially in electric motors used with variable speed drive (VSD) control devices, to ensure the reliability and longevity of the motors.

Electric motors connected to VSDs are susceptible to voltage transients that can exceed their insulation limits, particularly where long cable runs are involved between the VSD and motor. The high switching frequencies of modern VSDs, particularly those using Insulated Gate Bipolar Transistors (IGBTs), can generate voltage spikes that exceed the insulation limits of standard motors.

These voltage transients, characterised by rapid rise times, can lead to elevated voltage gradients within the motor windings, increasing the likelihood of insulation breakdown. Understanding how VSDs create these voltage spikes is key to selecting a motor that can withstand such stresses.

And this is why the CIV rating on a motor deserves attention: it represents the maximum voltage that the motor's insulation can safely withstand. Standard motors may not be adequately rated to withstand the elevated voltage conditions generated by VSDs, whereas inverter-duty motors are specifically designed with enhanced insulation systems to manage these challenges.

Reactor devices, or line chokes, are also often employed to reduce peak voltages transmitted from the VSD to the motor. By limiting the rise time of voltage spikes, these devices can help protect motor insulation from damage caused by excessive transients.

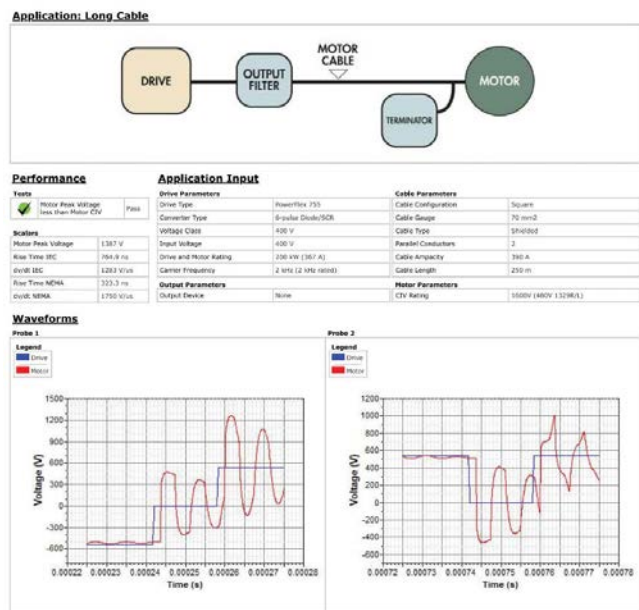
However, although reactors can enhance system reliability, they also introduce limitations in terms of cost and overall system efficiency. The initial investment for reactors needs to be balanced against potential savings from reduced motor failures and maintenance costs.

Motor terminators are another effective solution for reducing transient peak voltages at the motor terminals. Terminators work by absorbing voltage spikes and reducing reflections caused by impedance mismatches in long cable runs.

However, their effectiveness is contingent on cable length; as distances increase, the ability of motor terminators to mitigate transients diminishes. Implementing motor terminators is advisable for cable lengths of not more than 182 metres.

The risks of inadequate CIV ratings

When the voltage overshoot constantly surpasses the motor's CIV rating, it can trigger the corona discharge, damaging insulation



Monitoring voltage spikes in motors driven by VSDs.

and leading to short circuits within the motor windings to ground and even interphase.

Generally, the CIV tends to decrease with increasing carrier frequency of the alternating voltage under the influence of which the corona takes place.

This risk is exacerbated by factors such as cable length, cable type, and impedance mismatches between the motor and cable. According to industry standards, including NEMA MG1 Part 31, IEC 60034-25 and IEC 60034-18-41, motors should be rated to handle approximately 3.1 times phase to ground and 5.9 times phase to phase to their rated voltage to accommodate the transients effectively.

Using simulations to select the right motor

Several variations of corona test apparatus and circuits are available and can be used to generate typical corona environments for specific power system components and their operating conditions. The use of simulation tools can predict how different configurations will perform under operational conditions, revealing system voltages and identifying maximum voltage levels. These simulations provide valuable insights which enable optimisation of system performance and confirm if the apparatus is designed to handle the stress of real-world scenarios. Rockwell Automation, for example, offers an online simulation tool.

By using advanced simulation techniques, customers can make informed decisions in choosing their motors and mitigating risk. Simulations also enable the analysis of various scenarios, using different cable lengths and types, assisting customers to select motors that meet specific application requirements. Such simulations should be considered for power systems operating at

300 V or more.

A proactive approach can help customers – and system engineers – enhance system reliability and ensure that the electrical motors used have adequate CIV ratings.

For more information visit: www.referro.co.za

Drives, motors + switchgear: Products + services

New generation low-power frequency inverters

As a provider of integrated engineering solutions BMG offers a comprehensive electromechanical capability that includes customised system design, product selection, commissioning support and ongoing technical support.

New to BMG's electromechanical range are energy-efficient Synergy PI150 series frequency inverters, which are designed for use in applications ranging from machine tools to packaging, printing, food and beverage production, irrigation and pumping systems. The high-performance inverters are also effective in operating blowers, fans, conveyors and mixers.

“Our newly launched Synergy PI150 frequency inverters, which are versatile, general-purpose drives, are designed to enhance efficiency and reduce costs in industrial, manufacturing and various other market sectors,” says David Dyce, Business Unit Manager: Electronics, at BMG. “The PI150 series forms part of BMG's Synergy range, which is engineered for user-friendly operation, reliable performance, cost-effectiveness and ease of installation and commissioning.

“The new generation frequency inverters have a compact design, allowing for side-by-side installation without spacing, which minimises cabinet size requirements and lowers installation costs,” Dyce adds. “Energy-efficient operation also supports sustainability and contributes to overall cost savings for the user.”

Key technical capabilities include high-performance vector control, V/F control without an encoder and automatic motor adaptation (AMA). The inverters have a low temperature rise and support a wide input voltage range for single-phase (220-240 V)

and three-phase (380-440 V) systems. Integrated protection features include over-voltage, under-voltage and over-current safeguards. Additional advanced functionalities include PID feedback for precise closed-loop control, quick current limiting and automatic voltage regulation (AVR).

BMG's Synergy PI150 inverters are equipped with a built-in electronic thermal relay (ETR) for motor protection and offer compatibility with various control methods. Features like flying start, dc braking and torque control, ensure seamless operation under challenging conditions.

With its robust design, the range complies with the highest international standards, including IEC 61800-5-1 for safety and IEC 61800-3 for EMC (electromagnetic compatibility), to ensure enhanced reliability and optimum performance in demanding applications.

BMG specialists support the Synergy PI150 series with a technical advisory and support service, tailored to meet the specifications of contractors, designers and end users. A team of technicians, with extensive experience in motion control engineering, offers a comprehensive after-sales service, including 24-hour assistance, to ensure uninterrupted productivity.

BMG has been in business for over 50 years. It has specialist assembly and repair workshops for drives, conveyors, hydraulics and pneumatics, as well as electric motors, electronics, gaskets, lubrication systems and filtration. The company's extensive branch network across Africa provides easy access to quality branded products and services wherever they are needed.

For more information visit: www.bmgworld.net



BMG's new PI150 frequency inverters.

Size soft starters carefully

Soft starters are widely used in industry to protect motors and motor-driven equipment. However, it is important to size soft starters correctly for each application, otherwise the benefits can be lost, says Jaco Brits at WEG Africa.

According to Brits, Projects and Technical Manager for Drives and Controls at WEG Africa, a soft starter protects the motor and the load against mechanical shocks or jolts on startup. It does this, he explains, by controlling the voltage that is applied to the motor during startup, so reducing the starting current and allowing the gradual acceleration of the load up to the rated speed.

“Properly sizing the soft starter ensures that it can handle the specific motor and load to which it is connected,” he says. “If you under-size the soft starter, it may not reduce the starting current adequately or be able to accelerate the load – resulting in damage to the motor, electrical components or power supply infrastructure.”

Over-sizing a soft starter brings its own problems. Apart from not being cost-efficient, it may provide less precise control over motor acceleration and deceleration.

“Accurate sizing ensures that customers are not overspending on a unit larger than necessary. The correct size will deliver a balance between initial investment and long-term operational efficiency,” Brits says.

He highlights that the most important factors to consider are the specifications of the motor that the soft starter will be controlling as well as the characteristics of the driven load. The motor’s power rating directly affects the starting current required during motor startup, with higher power motors requiring larger starting currents.

“Motors with different power ratings operate at varying current levels, so the soft starter must be compatible with the motor to ensure proper operation,” he says.

He points out too, that the power rating often correlates with torque requirements, especially in applications with high torque demands, such as conveyors or crushers. In these applications,

the soft starter must be able to provide the necessary torque control during motor startup to achieve smooth acceleration and prevent mechanical stress on the motor and connected equipment.

“Loads vary widely across different applications,” Brits explains. “Crushers and fans, for instance, may demand enhanced torque control capabilities, while other applications have relatively constant torque demands – like pumps or blowers – which may require soft starters optimised for efficient energy usage rather than enhanced torque control.”

Some soft starters offer adjustable torque profiles or advanced algorithms to optimise torque delivery based on the load type. Another aspect that varies from one application to another is the acceleration and deceleration profiles.

“The user might also have specific needs for overload protection. And other types of motor protection may need to be considered,” Brits notes, “such as phase imbalance detection, undercurrent protection and over-temperature protection.”

The soft starter also needs to be compatible with the control systems in place – including the programmable logic controllers (PLCs) or supervisory control and data acquisition (SCADA) systems.

“To support customers in understanding more about soft starter technology and sizing, WEG Africa offers a range of resources and training opportunities,” says Brits. “Additionally, our technical team is on hand to examine customers’ applications and answer questions about size selection, installation and troubleshooting.”

For more information visit: www.weg.net



Jaco Brits, Projects and Technical Manager for Drives and Controls at WEG Africa.



As just one example, soft starters are commonly used in pump applications to reduce mechanical stress and ensure efficient motor operation.

Automating drive systems for efficiency and reliability



Willem Strydom, Manager, Business Development Electronics at SEW-EURODRIVE

Already in use among leading global manufacturers in South Africa, SEW-EURODRIVE's innovative MOVI-C® modular automation system offers a new level of flexibility, integration and efficiency to various industry sectors.

The MOVI-C® range was formally launched in South Africa at the Electra Mining Africa exhibition in September 2024, introducing new possibilities for local industries.

Willem Strydom, SEW-EURODRIVE's Manager Business Development Electronics, describes MOVI-C® as a modular automation system that includes all the necessary components for drive and control solutions, from software to hardware. He highlights that its modularity means it can be customised to meet the specific requirements of different applications and industries.

Customers have been attracted by the benefits the system offers, such as the seamless integration of all components, Strydom says, which ensures compatibility and reduces installation time. The technology also meets high energy efficiency standards, helping customers to reduce their operational costs and, at the same time, reduce their environmental impact.

"The modular system comprises cabinet inverters, decentralised field-mounted drives, motion controllers and the software, which all complement each other," he says.

A key feature of the system is the MOVILINK® digital data interface (DDI), which connects the drivetrain to the data system – delivering real-time information on indicators such as energy efficiency, application performance and condition monitoring.

"This innovative DDI solution is an important differentiator for SEW-EURODRIVE, as there is nothing comparable from other players in the market," says Strydom. It fits into the motor with no external or additional sensors and boasts a hybrid cable which is bespoke to SEW-EURODRIVE, connecting the motor to the variable speed drive (VSD). As well as carrying the power

supply, the cable carries the communications and condition monitoring data.

"The data generated and transmitted is key in facilitating predictive maintenance," he explains. "Customers can monitor important indicators such as the temperatures and vibration levels in a motor and gearbox, and the value of getting this information 'live' is that action can be taken quickly if critical operating parameters are breached."

The advanced features provide for the SEW IoT Suite software to alert the user by email, WhatsApp or telephone call – and, if need be, can shut down the application to prevent damage. The software interface can be employed on computer or as an app on a mobile phone, depending on how the user prefers to monitor the equipment.

"The real-time feedback from an application in the field also allows systems to be adjusted for optimal performance and efficiency," Strydom says. "For instance, the motor speed can be changed according to the demands of the application, saving energy and potentially extending machine life."

Importantly, the heightened sensitivity of the sensors means users are alerted earlier, as the sensors will pick up warning signs before human operators can hear or feel any indication of a problem.

Strydom highlights that the versatile system can be used for centralised or decentralised automation architectures, providing flexibility for different installation requirements. The MOVISUITE® engineering software is designed to be user friendly, so it simplifies the planning, commissioning, operation and diagnostics functionality.

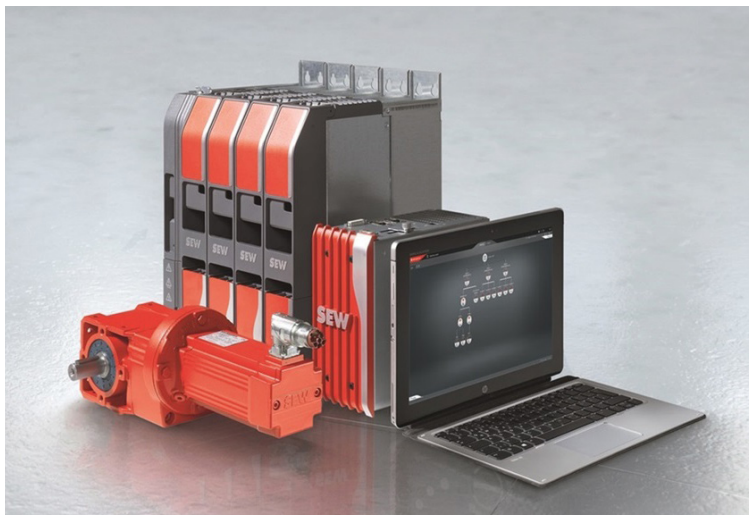
"The MOVI-C® system can also be scaled to meet the specific needs of various industrial processes, whether these are single-axis or multi-axis applications, with simple or complex motion control," he explains.

The MOVI-C® portfolio also includes preconfigured software modules, known as Movikits, for the implementation of simple drive functions such as speed control and positioning, through to complex multi-axes motion control functions. An example is the Anti-Sway Movikit, which is used to eliminate sway in overhead crane applications.

While MOVI-C® has applications across the board, Strydom says its powerful capabilities are well demonstrated, for example, in stacking and retrieval systems in industrial warehouses. Such applications include both a travelling element (sideways movement) and a hoisting element (up and down movement).

He adds that, "Wherever applications produce regenerative power, the regenerative power supply can harness that power and re-use it, directing it back into the system or storing it in battery packs or capacitor banks."

In South Africa, the system is being used by global automotive manufacturers and has also been embraced by the food and beverage sector. Strydom sees significant opportunities in the mining industry, in ventilation functions for instance, and plant activities using pumps that need more accurate control.



MOVI-C® is a modular automation system that includes all necessary components for drive and control solutions, from software to hardware.

For more information visit: www.sew-eurodrive.co.za

Faster progress needed on energy efficiency

At COP29, the 29th Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), in November 2024, apart from the negotiations on the new climate finance goal, intentions to take forward the so-called UAE consensus were pushed out to 2025.

The landmark energy package that emerged from COP28 in Dubai in 2023 confirmed governments' agreement on the need to triple renewable energy capacity and double the rate of energy efficiency improvements by 2030, and to transition away from the use of fossil fuels in energy systems.

Just ahead of COP29 last year, the International Energy Agency (IEA) released its *Energy Efficiency 2024* report on developments in energy efficiency around the world. One year on from the historic global pledge made at COP28 to double the rate of energy efficiency improvements by 2030, the report showed that countries are not yet on track to achieve this goal. The IEA points to the need for stronger action and cooperation among countries to align with their stated ambitions.

Energy Efficiency 2024 found that global primary energy intensity – a measure of efficiency – was set to improve by around 1% in 2024. This is the same rate as in 2023, and around half of the average rate of improvements achieved between 2010 and 2019. The agreement on the goal to double the rate of progress in energy efficiency, would mean increasing it from 2% in 2022 to 4% by 2030.

Getting more from everyday technologies

Boosting energy efficiency is about getting more from everyday technologies and industrial processes for the same amount of energy input. It also means more jobs, healthier cities, a cleaner environment and a range of other benefits. Improving the efficiency of buildings, vehicles, industrial processes and other areas where energy is used, is central to clean energy transitions everywhere. It helps to improve energy security, lowers energy bills for consumers and reduces greenhouse gas emissions.

The report from the IEA shows that governments worldwide are making policy progress, with those representing more than 70% of global energy demand implementing new or updated efficiency policies in 2024. The European Union, for example, revised regulations to achieve zero-emission building stock by 2050; China overhauled appliance standards and strengthened national targets for efficiency; the United States tightened its fuel economy standards for heavy-duty vehicles; and Kenya made its building code mandatory to ensure all new buildings are more efficient. However, to align with global targets, according to the report, fresh policies need to be formulated more quickly around the world, and many existing policies need to be tightened.

“Energy efficiency is a key pillar of secure, affordable and inclusive energy transitions. The IEA is working more closely with governments around the world to ensure that it remains a top policy priority,” said IEA Executive Director Dr Fatih Birol. “Fortunately, the policies and technologies to accelerate efficiency progress are readily available today, and many governments are taking important steps forward. What we hope to see now is faster



The IEA says doubling the rate of improvement in energy efficiency will require countries to accelerate policy implementation, and would also improve energy security, reduce energy costs and lower emissions.

and stronger policy responses around the globe.”

A progress tracker

To increase visibility on energy efficiency and support stronger progress towards the global doubling target, the IEA launched a new Energy Efficiency Progress Tracker when it released the report – extending the analysis of *Energy Efficiency 2024* to provide detailed insights via the most up-to-date regional indicators on energy intensity, demand and electrification levels. The Energy Efficiency Progress Tracker is an easy to access online dashboard that enables users to explore historical data, latest market estimates, and scenarios for energy demand, energy efficiency and progress in electrification.

It complements the agency's wider analytical support for governments, such as the IEA Energy Efficiency Policy Toolkits that are published annually.

The *Energy Efficiency 2024* report does highlight some important elements of progress worth noting, especially in major emerging economies and in the growing global deployment rates of heat pumps and electric vehicles, which generally use much less energy than the technologies they replace.

However, greater efficiency will need substantially more investment. Investment in energy-efficient technologies grew by 4% in 2024 – and is on course to reach a record USD 660 billion, according to the report. New IEA analysis reveals that efficient technologies do not necessarily cost more to buy than less efficient ones – and often cost much less over their lifetime, because they are cheaper to run. Best-in-class air conditioners, for example, can save up to 40% in total costs compared with inefficient systems.

For more information visit: www.iea.org



Zadok Olinga,
President,
SAEEC.

[Photo credit:
SAEEC]

Energy efficiency incentives for industry

As the International Energy Agency has stated, energy efficiency is the first fuel of the energy transition. Leigh Darroll, Editor of Electricity + Control, spoke to Zadok Olinga, President of SAEEC (South African Energy Efficiency Confederation), who is a strong proponent of energy efficiency. Olinga outlined some of the tax incentives that the SA Treasury offers to industry to encourage the implementation of energy efficiency measures as well as Eskom's Demand Management Programme, which comprises several levels.

Noting that these incentives offer savings over and above the direct savings in operational costs that improvements in energy efficiency deliver, Olinga also emphasised that they support the increasingly important requirement, globally and locally, to reduce carbon emissions. By optimising energy efficiency in their operations, companies can reduce their carbon tax liabilities and, for some exporters, mitigate potential CBAM^[1] penalties.

Considering further incentives that motivate greater energy efficiency in industry, Olinga cites Section 12L of the Income Tax Act as a primary incentive and explains that Eskom's Demand Management Programme (DMP) includes a load management incentive as well as an energy efficiency incentive programme.

Each incentive carries specific conditions – relating to, among other things, minimum and maximum allowable savings, single or multiple sites, and respective timelines – and all require the involvement of professional measurement and verification (M&V) services and SANAS accredited M&V Inspection bodies.

Section 12L – allowable tax deduction

Section 12L of the Income Tax Act was first introduced in 2013, when the rebate – or deduction allowed – amounted to 45c per kWh consumption (calculated on the tariffs applicable at the time). Motivated by SANEDI (the South African National Energy Development Institute), this incentive has been consistently renewed over the ensuing years and, in March 2015, was increased substantially to 95c per kWh.

The tax deduction can be claimed for one project per 12-month period (within a given tax year), although the project may pertain to multiple sites across an organisation's operations. Worth noting too, is that it can be claimed retrospectively.

This incentive is currently set to run only until 31 Dec 2025, which means companies considering the benefits of improving energy efficiency in their operations should line up projects for implementation within this calendar year.

Olinga says that although many energy intensive users, mines and other high energy demand industries like foundries, smelters, petrochemical plants, metals processing, manufacturing, logistics and suchlike, have taken advantage of the Section 12L tax incentive over past years, and have seen the returns not only in tax deductions but also in ongoing energy cost savings, his concern is that not many mid-sized and smaller manufacturing operations have taken up the opportu-

nity and the benefits it offers.

He suggests this may be because of a lack of awareness, or a lack of know-how and resources to assess their energy usage and identify the potential for efficiency improvements. This is where energy engineers, energy services companies (EsCos) and measurement and verification professionals can assist – in conducting energy audits, assessing usage and identifying potential savings.

For many medium to smaller-scale manufacturers, or even utilities, efficiency improvements and energy savings may be readily achieved in pumps and motors, boilers to optimise steam use, extruders, compressors – any equipment that uses energy, and in the power supply system itself, he says.

An energy audit is always the first step. Once the assessments are done, the implementation can be completed relatively quickly – swapping out inefficient equipment and replacing it with new where appropriate. But the preparatory work and determining a business case to improve efficiency and gain savings takes time.



Eskom's DMP

Another incentive still in place and available to industry is Eskom's Demand Management Programme, which offers customers a rebate of 45c per kWh for energy savings – specifically in peak demand times.

This incentive is available only to the C&I (commercial and industrial) sector. It invites industries and businesses to shift demand to outside of peak times to gain the rebate. It is applicable only to new, purpose-specific projects, aimed at reducing demand during peak demand periods. It motivates energy efficiency as well as peak shifting and peak clipping, as Eskom calls it, (otherwise known as peak shaving). For example, an organisation could make use of renewable energy, or stored energy, or alternative energy sources to cover its energy needs during peak demand periods and shift its demand for grid supply to off-peak hours, and so gain the rebate. The rebate becomes due per megawatt saved during peak demand periods.

Olinga says for high energy users and mid-level energy users in the C&I sector, the returns can be substantial: in the millions for high energy users like petrochemical companies or mines, and relatively significant returns are available similarly for mid-level energy users.

Energy audits

Typically, projects submitted for rebates in respect of either Section 12L or the Eskom DMP, or any other such incentive programme, require M&V quantification before they are approved. This underscores the essential first step of conducting an energy audit, to establish a baseline measure of energy consumption, and identify potential areas for efficiency improvements, before any adjustments or interventions are made – and against which savings can be quantified.

Olinga says South Africa has globally recognised professional skills in the field of measurement and verification. MVCSA, the Measurement & Verification Community of South Africa, is aligned with the SAEEC and forms part of the organisation. MVCSA has also been instrumental in setting up inspection bodies, to ensure that standards such as SANS/IEC 17020 and 15010 are met and maintained, and in seeing to their accreditation by SANAS (the South African National Accreditation System), effective from 2013.

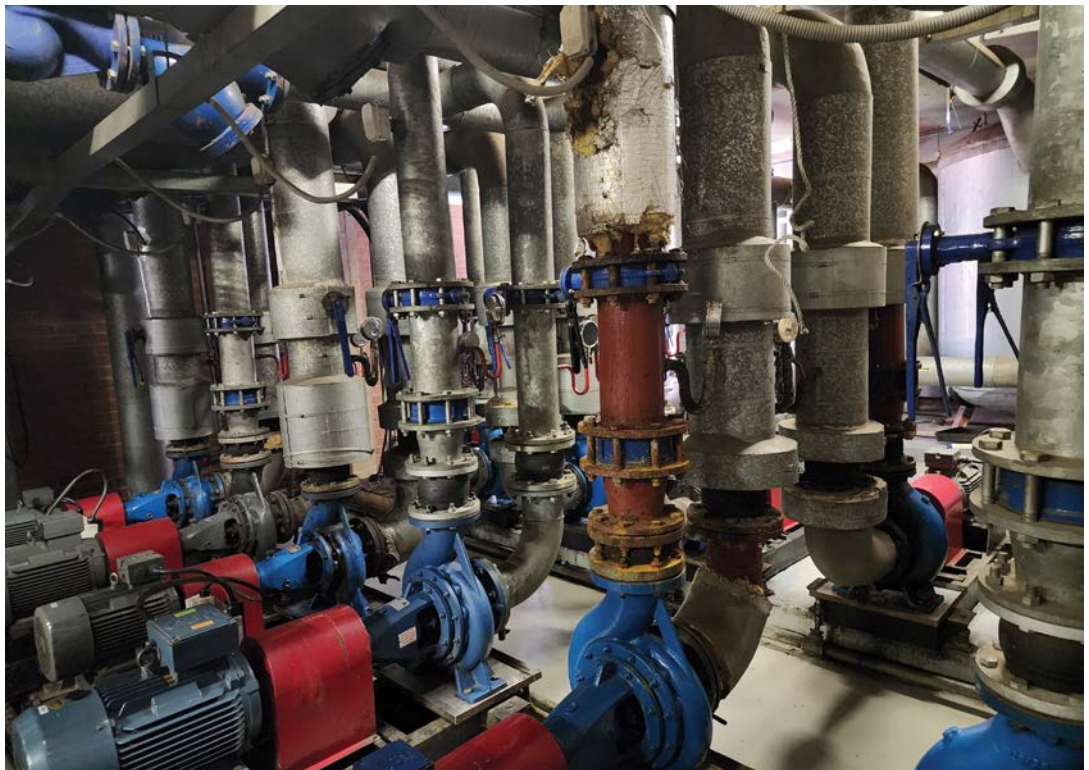
He says, efficiency improvements and energy savings achieved with the introduction or retrofitting of new equipment, or implementation of new processes are usually quantified in terms of kWh per tonne of output.

He also notes that engaging M&V professionals to validate energy efficiency programmes, or planned programmes, and to structure projects to claim on the 12L incentive or Eskom's DMP will incur costs and often entail considerable complexity. Businesses need to recognise this and, at the same time, recognise that they will gain energy (and cost) savings and reduced carbon emissions, even if they do not pursue any of the structured rebate options.

NCPC

Olinga also points to the National Cleaner Production Centre (NCPC) at the CSIR which, over several years, has driven a more broadly focused industrial efficiency programme, addressing the efficient use of resources, including energy and water, and managing waste efficiently. He describes it as a helpful programme that focuses on resource efficient and cleaner production. It has developed a range of services and offers industry and sector knowledge-sharing, company technical support, green skills development, and advocacy and awareness-raising.

The NCPC consultation process starts with a walk through the plant to assess opportunities for improvement. Its teams offer guidance to



For many mid- to smaller-scale manufacturers, or even utilities, efficiency improvements and energy savings may be readily achieved in pumps, motors, compressors – any equipment that uses energy.

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companies, with a focus on achieving best practice in terms of SANS 50001– Energy management systems, among other improvements in resource management.

A new industry and new jobs

Assessing energy efficiency and resource efficiency, monitoring emissions and emissions reductions, are all relatively new areas of industry and present new business opportunities and the potential for new jobs. Installing variable speed drives and smart metering technologies, for instance, require new skills and bring new value to the economy; energy audits, action plans and implementation – all present new work opportunities.

The IEA has said that energy efficiency can contribute 33% of the new jobs created through the energy transition.

Olinga voices a concern that in South Africa, and perhaps globally, energy efficiency has been pushed aside by the focus on renewable energy, security of supply, and the push to clean energy. He acknowledges that they all have a role to play, they are all important, but he emphasises that the first step must be measurement. “You need to know how much energy you are using. The next step must be improving efficiencies. If you don’t optimise efficiencies in energy usage before investing in alternative energy sources to supplement supply – you are just baking in inefficiencies and ignoring the root cause of high energy costs. You would be masking potential improvements and sacrificing potentially significant energy and cost savings.

“Energy engineers can assist businesses to identify energy saving opportunities, energy conservation measures, per site, per process, to assess energy demand per load and determine the potential savings. In this way they can prepare the business case for investing in new equipment or systems, calcu-

late the respective returns and determine the payback period. They will also look at tariff structures, time of use, and the potential for peak shifting or peak shaving.”

In closing Olinga says he is encouraged that the government in South Africa is now taking a more proactive stance in refocusing on demand management and energy efficiency. He says the SAEEC has had conversations with the Deputy Minister of Electricity and Energy, Samantha Graham-Maré, and notes that at government level, SA is engaging with the IEA for advice and guidance in this respect.

Note:

[1] *The European Union’s proposed Carbon Border Adjustment Mechanism, set to take effect in 2026.*

The Southern African Energy Efficiency Confederation (SAEEC) is the local chapter of the Association of Energy Engineers® (AEE), which is based in Georgia in the USA, and the first chapter established in Africa. AEE services more than 100 countries with over 90 local and international chapters.

The SAEEC supports a membership of more than 900 professionals in Southern Africa who are committed to helping their companies and clients increase energy efficiency, adopt innovative energy service options, enhance environmental management programmes, upgrade facility operations, and improve operational performance.

[All images courtesy of Zadok Olinga, unless noted otherwise.]

For more information visit: <https://www.saeecconfed.org.za/>



Energy efficiency improvements can often also be made in the power supply system itself, Olinga says.

Moving to clean energy would benefit local manufacturing



Forbes Padayachee,
CEO, Yellow Door Energy
South Africa.

Forbes Padayachee, CEO of Yellow Door Energy South Africa, makes the point that attracting global investment into the country's manufacturing sector is key to driving industrialisation and economic growth. "So, understanding investor requirements in local manufacturing projects is essential for industry stakeholders. As important is understanding the expectations of importers sourcing goods from local manufacturers," she says.

Key factors influencing investment and import decisions include political stability, policy certainty, regulatory frameworks, infrastructure quality, workforce skills, and sustainability.

South Africa's competitive advantages in manufacturing, such as abundant natural resources and a growing consumer market, present considerable opportunities. However, realising these benefits requires addressing challenges in areas such as supply chain efficiency and technology adoption.

In terms of sustainability measures, a widespread transition from grid power to renewable energy, like solar, would enhance the local manufacturing industry's position in global value chains, and support robust export levels in the next few years.

This transition can only be enabled by a fast-growing renewable energy sector, which is likely to see accelerated growth in Africa in the years ahead, as the demand for electricity and the need for clean energy generation capacity increase. Furthermore, the declining cost of renewable power continues to deliver material savings compared to increasingly expensive and erratic grid-sourced power.

In the global context

Local manufacturers need to reduce carbon emissions to stimulate investment and export. Considering the wider context on carbon emissions, Padayachee notes that the European Union, a key market for South Africa-based manufacturers, began implementing its Carbon Border Adjustment Mechanism (CBAM)^[1] transition phase in October 2023; it is scheduled to come into full force in 2026. This is the EU's tool to "put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries."

- During the transition phase, EU-based importers of goods covered by CBAM from non-EU countries must report the embedded emissions of their imports but will not incur any financial liabilities.
- However, after 2026, if carbon emissions exceed the prescribed level, importers will have to pay an additional tax or purchase carbon credits to offset their emissions. For now, the industries subject to CBAM are electricity, aluminium, iron, steel, cement, fertilisers, and hydrogen. Agriculture is currently excluded but indications are that

food imports will be taxed by 2035.

The UK is also putting in place its own CBAM^[2], which will include agriculture far sooner, as are Canada and Japan.

According to *Africa Confidential*, impact assessments suggest that in Africa, South Africa's economy will be hit hardest by CBAM, with a possible 4% drop in exports to Europe.

In this context, it is clear that locally based manufacturing companies that put in place infrastructure to reduce their carbon footprint significantly, stand to stay on the right side of evolving global legislation with respect to carbon emissions, and will avoid potentially negative impacts pertaining to investments and/or exports.

Operationally, transitioning from grid power to a solar energy solution, via a power purchase agreement (PPA) with an independent power producer, is a practical, cost-effective solution to achieving this goal.

Factors influencing investment

Padayachee highlights some of the key considerations with regard to attracting foreign investment to support the growth of local manufacturing.

- Stability and certainty of policy framework: For example, are private investors welcome in the country? What is the ease of doing business in the country? Is there institutional capacity to support the policy framework?
- Basic economics: Is there a market; is it cost-effective, and does it deliver a competitive advantage versus alternatives (such as imports)?
- Cost and time certainty of the market opportunity: How easy is it to price in the development cycle? For example, here in South Africa's renewable energy sector, government has had a clear policy and the right institutional support, with a defined timetable, which, initially, led to significant investment in the sector and turned the REIPPPP (Renewable Energy Independent Power



A widespread transition to renewable energy, like solar, would enhance the local manufacturing industry's position in global value chains, and support robust export levels.

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policy and the right institutional support, with a defined timetable, which, initially, led to significant investment in the sector and turned the REIPPPP (Renewable Energy Independent Power Producer Procurement Programme) into a success story.

Africa's competitive advantage

Africa faces competition from other developing economies like India, China and Vietnam and South Africa needs to look at the specific incentives that can attract manufacturing to the continent and the country. These include:

- Africa is home to the youngest population in the world with 70% of people in sub-Saharan Africa being under the age of 30 years. By 2030, 42% of the world's youth would be in Africa, 75% of them under the age of 35 years. This is a positive for a young and productive workforce (all things being equal, including training opportunities to develop a skilled and competitive workforce).
- Land availability: SA, and Africa generally, have plenty of land to support the development of businesses and development zones.
- With CBAM considerations in mind, the relatively low cost of energy and the use of renewable energy in lowering costs for manufacturers are significant. There has been a 76% decrease in solar PV (photovoltaic) costs in South Africa since 2010, and a 55% decrease in wind energy costs in the same period.
- Finally, our greatest asset is our people. Continuous education and investment in our workforce are vital to our long-term success in the manufacturing sector.

In closing Padayachee suggests that manufacturers should future-proof their energy strategies today. The world is competitive, and South Africa has tremendous potential. Manufacturers need to future-proof their energy needs and their operations, so that they can focus on their core business. □

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Yellow Door Energy (YDE) provides cost-competitive renewable energy solutions to leading commercial & industrial businesses in South Africa. With flexible contract terms in the power purchase agreements (PPAs), YDE's team of dedicated energy experts delivers projects swiftly, safely and sustainably. With strong B-BBEE credentials, YDE is committed to helping businesses lower electricity costs, decarbonise their operations and advance South Africa's just energy transition.

For more information visit: www.yellowdoorenergy.com

Energy management + energy efficiency: Products + services

Choosing the right inverter

Choosing the right inverter is important in ensuring optimal performance, reliability, and cost-effectiveness in your energy system. In South Africa, the energy environment is characterised by challenges in grid stability and high electricity prices, among other factors. Growatt Energy in South Africa provides tailored solutions that offer customers several advantages.

Battery ready systems

Growatt's battery ready systems are designed with a pre-configured interface for easy integration with energy storage systems. This feature eliminates the need for additional modifications when adding storage, simplifying installation and enhancing efficiency. In South Africa, where energy costs can be optimised by storing electricity during low-price periods or high sunshine, this solution is ideal for reducing peak-time energy costs.

Grid-tied systems

Growatt provides a range of smart PV (photovoltaic solar) solutions suitable for residential, commercial, and utility-scale solar plants, with capacities ranging from 0.75 kW to 350 kW. Its grid-tied inverters allow for users to sell excess

electricity back to the grid, generating an economic return. In areas without grid-connection policies, anti-reflux equipment can be installed to maximise the user's own consumption.

Energy storage solutions

If grid stability is a concern, Growatt offers various energy storage solutions, including all-in-one systems, off-grid systems, commercial storage systems, and hybrid storage systems. The company's local service centre in South Africa provides professional product training and high-quality after-sales service to ensure customers' needs are met. □



Growatt offers various inverters and energy storage solutions to meet residential, commercial, industrial, or utility scale requirements.



Giordano Albertazzi,
CEO, Vertiv.

Prioritising energy efficiency in data centres 2025

AI continues to reshape the data centre industry. This reality is reflected in the projected 2025 data centre trends issued by Vertiv, where experts anticipate increased industry innovation and integration to support high-density computing, regulatory scrutiny around AI, as well as increasing focus on sustainability and cybersecurity.

“Experts at Vertiv correctly identified the proliferation of AI and the need to transition to more complex liquid- and air-cooling strategies as a trend for 2024, and activity on that front is expected to further accelerate and evolve in 2025,” said Vertiv CEO Giordano Albertazzi. “With AI driving rack densities into three- and four-digit kilowatts, the need for advanced and scalable solutions to power and cool those racks, minimise their environmental footprint, and empower these emerging ‘AI factories’ has never been higher. We anticipate significant progress on that front in 2025, and our customers demand it.”

Outlined below are the trends Vertiv sees as most likely to emerge across the data centre industry through 2025.

Innovations in power and cooling

In 2025, the impact of compute-intense workloads will increase, with the industry managing the sudden change in various ways. Advanced computing will continue to shift from CPUs (central processing units) to GPUs (graphics processing units) to leverage the latter’s parallel computing power and the higher thermal design point of modern chips. This will further stress existing power and cooling systems and push data centre operators towards cold-plate and immersion cooling solutions that remove heat at the rack level. Enterprise data centres will be impacted by this trend, as AI use expands beyond early cloud and colocation providers.

- AI racks will require UPS systems, batteries, power distribution equipment and switchgear with higher power densities to handle AI loads that can fluctuate from a 10% idle to a 150% overload in a flash.
- Hybrid cooling systems, with liquid-to-liquid, liquid-to-air and liquid-to-refrigerant configurations, will evolve in rackmount, perimeter and row-based cabinet models that can be deployed in brown/greenfield applications.

- Liquid cooling systems will increasingly be paired with their own dedicated, high-density UPS systems to provide continuous operation.
- Servers will increasingly be integrated with the infrastructure needed to support them, including factory-integrated liquid cooling, to make manufacturing and assembly more efficient, deployment faster, equipment footprint smaller, and to increase system energy efficiency.

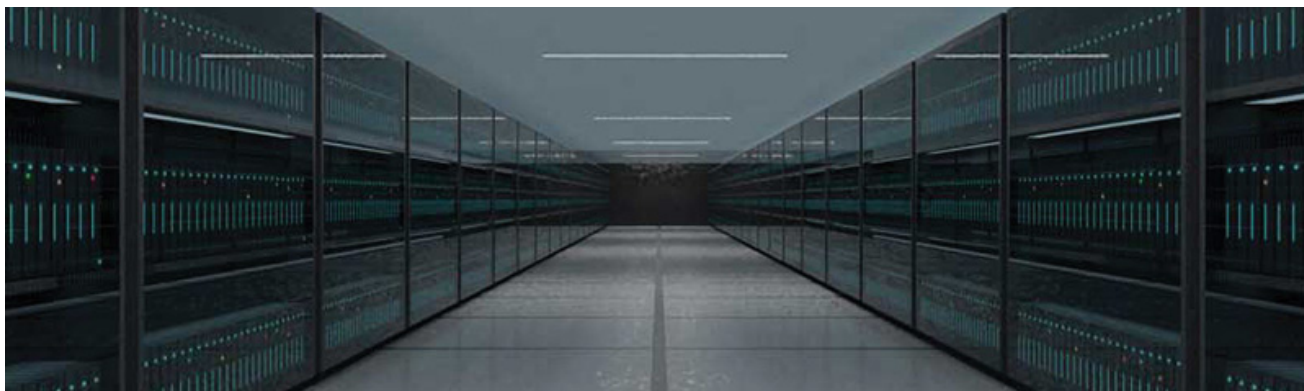
Energy availability

Overextended grids and soaring power demands are changing how data centres consume power. Globally, data centres use an average of 1 to 2% of the world’s power, but AI is driving increases in consumption that are likely to push that to 3 to 4% by 2030 ^[1]. Expected increases may place demands on the grid that many utilities cannot handle, attracting regulatory attention from governments around the globe – including potential restrictions on data centre builds and energy use – and spiking costs and carbon emissions that data centre organisations are racing to control. These pressures are forcing organisations to prioritise energy efficiency and sustainability more than they have until now.

In 2024, Vertiv predicted a trend towards energy alternatives and microgrid deployments, and in 2025 it anticipates an acceleration of this trend, with real movement towards prioritising and seeking out energy-efficient solutions and energy alternatives that are new to this arena. Fuel cells and alternative battery chemistries are increasingly available for microgrid energy options. Over the longer term, many companies ^[2] are developing small modular reactors ^[3] for data centres and other large power consumers, with availability expected around the end of the decade. Progress on this front warrants watching in 2025.

Collaboration on AI factory development

Average rack densities have been increasing steadily over the past few



It is expected that AI could drive increases in data centres’ power consumption globally, to 3 to 4% of the world’s power by 2030.

Energy management + energy efficiency

years, but for an industry that supported an average density of 8.2 kW in 2020, the predictions of AI factory racks of 500 to 1 000 kW or higher soon, represent an unprecedented disruption. As a result of the rapid changes, chip developers, customers, power and cooling infrastructure manufacturers, utilities and other industry stakeholders will increasingly work together to develop and support transparent roadmaps to enable AI adoption. This collaboration will extend to development tools powered by AI to speed engineering and manufacturing for standardised and customised designs. In the year ahead, chip makers, infrastructure designers and customers will increasingly collaborate and move towards manufacturing partnerships that enable integration of IT and infrastructure.

AI makes cybersecurity harder – and easier

The increasing frequency and severity of ransomware attacks is driving a new, broader look at cybersecurity processes and the role the data centre community plays in preventing such attacks. One third of all attacks ^[4] last year involved some form of ransomware or extortion, and today's bad actors are leveraging AI tools to ramp up their assaults, cast a wider net, and deploy more sophisticated approaches. Attacks increasingly start with an AI-supported hack of control systems, embedded devices or connected hardware and infrastructure systems that are not always built to meet the same security requirements as other network components. Without proper diligence, even the most sophisticated data centre can be rendered useless.

As cybercriminals continue to leverage AI to increase the frequency of attacks, cybersecurity experts, network administrators and data centre operators will need to develop their own sophisticated AI security technologies. While the fundamentals and best practices of defence in depth and extreme diligence remain the same, the shifting nature, source and frequency of attacks require new nuances in modern cybersecurity efforts.

Potential regulations on AI and energy use

Vertiv's 2023 predictions focused on government regulations

for energy usage. For 2025, it expects to see regulations potentially increasingly address the use of AI. Governments and regulatory bodies around the world are racing to assess the implications of AI and develop governance for its use. The trend towards sovereign AI – a nation's control or influence over the development, deployment and regulation of AI and regulatory frameworks aimed at governing AI – is a focus of the European Union's Artificial Intelligence Act and China's Cybersecurity Law (CSL) and the AI Safety Governance Framework. Denmark recently launched its own sovereign AI supercomputer ^[5] and other countries too have undertaken their own sovereign AI projects and legislative processes to extend regulatory frameworks, an indication of the trajectory of the trend. Some form of guidance is inevitable, and restrictions are possible, if not likely.

Initial steps will be focused on applications of the technology, but as the focus on energy and water consumption and greenhouse gas emissions intensifies, regulations could extend to types of AI application and data centre resource consumption. In 2025, Vertiv expects governance will continue to be local or regional rather than global, and the consistency and stringency of enforcement will be likely to vary widely. □

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For more information visit: [Vertiv.com](https://www.vertiv.com)



The compute-intensive workloads of data centres will demand smarter power and cooling solutions.

How to manage reactive power

In low-voltage systems, reactive power compensation, known as PFC (Power Factor Correction), plays an important role in optimising costs and improving the efficiency of devices. Reactive power, generated by motors, transformers, or lighting systems, can lead to overloads, downtime, increased equipment failure, and reduced lifespan. Implementing solutions for power factor correction is essential to minimise the negative impact of reactive power on installations and devices, as well as to reduce operational costs related to electricity consumption and premature wearing in equipment.

Capacitors and power factor controllers are integral components of PFC systems. Here, TME (Transfer Multisort Elektronik) presents the devices from the Epcos brand that it carries, highlighting their advantages in demanding industrial and energy applications.

The Epcos brand, part of the TDK group, offers advanced solutions in reactive power compensation and correction. The BR6000 and BR604 series controllers and MKK series polypropylene capacitors can be used to improve the power factor in low-voltage systems significantly, leading to higher efficiency and long-term savings.

Reactive power controllers

The Epcos BR6000 and BR604 series reactive power controllers, available from TME, are essential devices in reactive power compensation systems. Their main function is to measure the current power factor and connect or disconnect capacitors that compensate for reactive power, in order to achieve the desired $\cos \phi$ value.

The BR604 series controllers offer four outputs, and the BR6000 series controllers provide either six or 12 relay outputs as well as an alarm relay. All the devices are designed for front-panel installation in reactive power compensation systems and are secured using terminal clamps.

The BR6000 and BR604 series controllers are equipped with a microprocessor that analyses the signal from the current transformer. Based on load parameters and the current $\cos \phi$ power factor, the microprocessor determines how much additional capacitance (capacitor stages) is needed to compensate for reactive power.

In standard PFC systems handling slow-varying loads (which is what the Epcos BR6000 and BR604 controllers are designed for), the microprocessor sends a signal to activate the contactor. The contactor then switches on the appropriate number of capacitor stages (or switches them off, depending on the needs). Adding or removing capacitor stages improves the power factor by compensating for the phase shift between current and voltage.

Microprocessor-controlled reactive power compensation, as used in Epcos controllers, offers several benefits for the entire system:

- Balanced use of capacitor stages
- Reduced switching frequency
- Extended PFC system lifespan.

Using capacitors to improve power factor

The MKK series of polypropylene capacitors from Epcos, and available from TME, are specifically designed for reactive power compensation in low voltage systems. Offered in single-phase and three-phase variants, all capacitors feature screw terminals and aluminium housings.

Epcos MKK cylindrical capacitors use polypropylene film as the dielectric material, ensuring low energy losses and high operational stability, even under heavy loads. The use of metallisation technology gives MKK capacitors a limited self-healing capability. In the event of minor dielectric damage, the metal around the damaged area degrades, isolating the defect and allowing the device to continue functioning. This self-healing feature reduces the risk of failure and extends the lifespan of the capacitors. MKK capacitors can withstand high current impulses, making them ideal for demanding applications such as motor drives, control systems, or complex lighting setups.

The compact, cylindrical aluminium housing provides for efficient use of space in control cabinets and provides excellent thermal properties. With a high capacitance-to-volume ratio, the capacitors enhance the energy efficiency of the entire power system and reduce installation costs. The lightweight aluminium housing and optimised installation process shorten assembly time, making integration into the system easier.

Epcos MKK capacitors ensure safe operation. In addition to the self-healing capability afforded by the metallised polypropylene, they are equipped with overload protection (overload switch) and shock protection. Another advantage of the capacitors is their environmentally friendly and user-safe design. The dry construction eliminates the need for oil, thus eliminating the risk of oil leaks, as the capacitors are filled with a non-flammable inert gas. □



A controller with up to six outputs.



A capacitor with a capacitance of 116 µF.

For more information visit: www.tme.eu/en/

Increasing demand for high voltage power backup solutions

Businesses across industry sectors are facing increasing pressure to rethink their approach to power, either because they are experiencing recurring disruptive power cuts caused by crumbling infrastructure or because they are looking to save costs, particularly in high electricity usage industries. REVOV MD Lance Dickerson says that as result, there has been a significant uptick in interest in high voltage (HV) installations, either as standalone battery energy storage systems (BESS) or as solar installations feeding into battery storage.

According to a World Bank report, Dickerson says, the South African battery energy storage market is expected to grow from 270 MWh in 2020 to 9 700 MWh in 2030 under a base-case scenario, and up to 15 000 MWh under a best-case scenario. As demand in the residential sector slows, much of this continuing growth will be driven by demand for HV systems.

Dickerson says there are a number of options for businesses to consider, although most of them are imported modular systems, which present challenges when support is needed, and specific local conditions need to be understood. “Most businesses prefer working with local support rather than facing the logistical hurdles of dealing with companies in China. In addition, many businesses are not prime candidates for a one-size-fits-all modular approach and instead require a bespoke, purpose-designed solution.”

Dickerson says that prior to moving into the HV market, where REVOV is now well-established, it took the time to develop an offering that meets technical specifications and addresses real-world challenges faced by customers in South Africa and neighbouring countries.

“We spent time listening to the market and understanding the key challenges businesses encountered. In response, we developed a solution to suit South Africa and its neighbouring countries. Some battery suppliers source their modular

systems from overseas, whereas all REVOV’s batteries are assembled in South Africa, under the close supervision of our engineering team. This ensures quality control and provides a crucial advantage in terms of after-sales support and responsiveness,” says Dickerson.

Responsive local support is crucial. It means that if something goes wrong with an HV system, customers don’t have to wait weeks, or months in some cases, for on the ground support to arrive from foreign suppliers.

Dickerson says many battery businesses operate on a one-size-fits-all model, where customers must choose from a limited set of pre-determined battery pack sizes. “Modular systems are obviously important as they allow businesses to upsize, or downsize, based on their circumstances. The problem arises when the pre-determined battery pack sizes are not ideal for certain applications. This led us to take a different approach. We offer both modular and fully customised solutions that are tailored to the specific requirements of each business.”

For businesses looking to invest in an HV system, Dickerson emphasises that local support should be a key consideration.

“An HV backup system is a big investment but, done properly, it can pay itself off in a far shorter period of time than one would expect. So, the best advice I would give prospective buyers is to look for a business that doesn’t just sell batteries and then leave. Seek out a partner that will work closely with you to understand your specific needs and design and implement solutions tailored to your business.”

By addressing these needs with bespoke, locally supported solutions, companies like REVOV are well-positioned to meet South Africa’s growing demand for high-voltage power backup systems. □

For more information visit: www.revov.co.za



REVOV supplies modular and customised backup solutions tailored to the specific requirements of each business.

Successes in 2024 open the way for 2025

Senior Vice President of the Electrification Products division of ABB, Graham Abrahams, recently reported on the division's achievements through 2024 across different business areas. One of the highlights he noted was securing the first OneFit order, local manufacture of the solution at ABB South Africa, and its successful installation at the customer's site.

ABB's OneFit is a retrofit solution designed for medium voltage switchgear. It features a hard bus retrofit design concept that allows for the easy connection of new circuit breakers to a wide range of existing panels, irrespective of their age, design, or brand.

Abrahams said the Service business within the division performed exceptionally well, achieving a standout year in terms of growth and customer engagement, and the Products business maintained strong momentum throughout the year, demonstrating its robustness and reliability.

In the Projects business, he highlighted progress in the CSS/LVS (compact secondary substations and low voltage switchboards) technology transfer programme – enabling local manufacturing and marking a significant step forward in growing the company's regional production capabilities.

Abrahams also shared ABB's newly introduced rebranding slogan: 'Engineered to Outrun'. "It reflects our commitment to innovation, efficiency, and sustainability," he said. It confirms ABB's positioning as a solutions provider and it speaks to the company's engineering expertise and its work with customers as a trusted partner to deliver advanced, reliable solutions.

He highlighted that, in the Electrification Products division, "Both our medium voltage and low voltage businesses are emphasising digitalisation, which aligns with our goals to reduce the carbon footprint, for ABB and for our customers."

With its advanced digital technologies, ABB offers smart, connected solutions, enabling greater energy efficiency and resource optimisation – and benefitting customers by enabling them to operate 'leaner and cleaner'. Its products are designed to consume less energy and reduce emissions, and they exceed performance expectations in sustainable engineering.

Today, companies globally are setting ambitious targets to reach carbon neutrality and sustainability. ABB supports these goals by providing efficient solutions that contribute directly to reducing emissions and energy usage, which translates to a lower carbon footprint and a reduced environmental impact.

"ABB is at the forefront of driving sustainability and efficiency, aligning with Africa's move towards sustainable and resource-efficient industries. We have set ambitious targets to achieve carbon neutrality in all our manufacturing facilities by 2030. Through the use of our own technologies and solutions, we have already met this target, four to six years ahead of schedule," Abrahams said.

ABB aims to maintain its leading position in the electrification and automation fields by maintaining its technological edge, fostering sustainability, and investing in research and development. "We have also been active in shaping the future of energy efficiency, as founding members of the Energy Efficiency Movement. This initiative reflects

our commitment to driving positive environmental impact and creating a more sustainable world," said Abrahams.

Looking ahead to 2025, the Electrification Products division is focused on continuing to drive digital solutions within the business and for customers. "Digitalisation is key to enhancing efficiency, sustainability, and operational performance. We remain dedicated to integrating these solutions across all aspects of our operations," said Abrahams.

"We are also committed to supporting the growing renewable energy sector, which is rapidly ramping up in response to global sustainability demands. By providing innovative technologies and solutions, we aim to help accelerate the transition to renewable energy, enabling customers to meet their sustainability targets," he said. □



Graham Abrahams, Senior VP, Electrification Products, ABB.

For more information visit: go.abb/electrification



The Electrification Products division is playing a part in progressing ABB's regional production capabilities, with local manufacture of compact secondary substations, for example.

Sensors serve process control in digitalised recycling

Drinking bottles, food packaging, bags, toys: many things used in everyday life are made of plastic – but only some of them we need for more than a few hours or days. Around 400 million tonnes of plastic are produced worldwide every year. And only a small share of this is recycled and reused. Among the players that keep the plastics cycle turning are the Austrian EREMA Group and PET-Verpackungen GmbH from Germany.



EREMA, a manufacturer of recycling systems, relies on hardware and vibration expertise from ifm.

The EREMA Group is committed to giving plastics a new life. It develops and produces plastics recycling systems and the associated solutions and services. About 7 500 active plants supplied by EREMA worldwide have the capacity to produce more than 20 million tonnes of recycled granulate.

“To produce the granulate, the plastic is delivered to the operators of our systems in the form of flakes, which are already shredded, clean and sorted,” says Florian Schieder, R&D Management & IPR at *EREMA Engineering Maschinen und Anlagen GmbH*.

“The flakes are then dehumidified, compacted, melted, filtered and then granulated in our plants. The granulate produced provides the basic recycled material for reuse, to manufacture new plastic products.”

If food-grade granulate is to be produced, as is the case at *PET-Verpackungen GmbH*, for example, the flakes are shredded at a higher temperature and under vacuum. “This ensures firstly, that the material is decontaminated, and further, the special treatment enables us to achieve better colour properties for both the granulate and the end product,” Schieder continues.

Up to 80 vibration sensors per system

EREMA relies on sensor technology and IO-Link masters from ifm to control the manufacturing process. “We have

been using pressure sensors, photoelectric distance sensors and flow sensors for a long time to ensure that all relevant process values are adhered to and that the material flow takes place at the required speed,” says Yvonne Kappacher-Winter, Development Project Manager PredictOn at *EREMA Engineering Maschinen und Anlagen GmbH*.

“We are now digitalising our systems further by equipping motors, gears, vacuum pumps and roots compressors with up to 80 vibration sensors and other oil condition sensors. This enables us to record the system’s maintenance requirements precisely. The customer can see information on the health status of the system via our PredictOn predictive maintenance system, both directly on the system and via our BluPort customer portal. This enables early damage prediction and the planning of appropriate maintenance measures to minimise downtime,” says Kappacher-Winter.

Digitalisation: everything from a single source

Schieder adds: “We have customers who operate their systems



The sensor data from the recycling plant is collected decentrally via an IO-Link master and forwarded to the control system in bundled form.



Up to 80 vibration sensors are installed in a current EREMA system. They monitor, for example, the motors and gears of the system.



EREMA, a manufacturer of recycling systems, relies on hardware and vibration expertise from ifm.

around the clock and produce up to six tonnes of granulate per hour. The long-term availability of our machines is becoming increasingly important for us and our customers. It was clear to us that we needed more sensor technology and further digitalisation to be able to detect and avert impending failures at an early stage. We needed a strong partner who could support us with the right products and expertise in vibration analysis. At ifm, we receive everything from a single source, from the sensor to the evaluation electronics, IO-Link master and gateway. This makes it easy for us to offer the customer a seamless solution. They can see the processed data on their laptop and smartphone at any time and take appropriate action, including ordering spare parts from us.”

Containers made from 100% recycled material

PET-Verpackungen GmbH also appreciates precisely these possibilities of data-based maintenance planning. As part of the Wiegand Glas Group, the company primarily produces PET preforms for the beverage industry, as well as moulded PET containers with capacities of 10 millilitres up to 30 litres.

“The topic of recycling is becoming more and more important for us. Our customers are increasingly asking for products made from recycled materials. In some cases, the proportion is 100 per cent,” says Matthias Raab, Operations Manager at PET Packaging.

“That is why we decided to commission our own recycling plant three years ago and chose EREMA as our technology partner.” *PET-Verpackungen* produces up to 50 tonnes of granulate every day for further processing. “In order to maintain the production process, it is important that all systems and processes function reliably. The digitalisation solution from EREMA supports us enormously here, as the condition monitoring and planning of maintenance is considerably simplified by the data provided,” says Raab.

Conclusion

With integrated solutions for digitalised, comprehensive system monitoring, ifm helps EREMA to offer its customers added value in the plastics recycling process. With condition-based maintenance, system availability is increased, and the recycling potential is maximised. □

For more information visit: <http://www.ifm.com>



The evaluation electronics in the control cabinet process the data from the vibration sensors and transmit the results via Ethernet to the gateway, the IIoT controller from ifm.



The IIoT controller transmits all sensor data to the higher IT level, where it can be accessed by EREMA customers at any time on a laptop or smartphone.

New acquisitions extend measurement technologies available

Senseca, a leader in environmental monitoring and measurement technology operating globally, has acquired Spanish company GEONICA, which specialises in system engineering and integration and environmental solutions, as well as UK-based Biral, a provider of high-precision meteorological sensors.

Commenting on this move, Senseca Chief Executive Officer, Christian Unterberger said: "With the skills sets that these acquisitions bring to Senseca, we see opportunities to grow our global presence with the expansion of our measurement instrumentation range, giving us a greater market reach. The synergy of our technical solutions enables us to deliver comprehensive environmental measurement systems that fully meet the needs of our customers.

"GEONICA brings to the table strong data logger competence, expertise in data acquisition, transmission and management via its own solutions, and Biral's specialised focus on visibility and current weather sensors, as well as thunderstorm detection, aligns with our strategy of creating a focused and comprehensive portfolio of environmental sensor technologies. Both acquisitions will strengthen our leadership in the environmental measurement market."

Jan Grobler, Managing Director of Senseca South Africa added: "High-precision weather monitoring can benefit various sectors, from renewable energy to aviation, marine operations, infrastructure and road safety, among others.



Senseca Chief Executive Officer, Christian Unterberger.



Jan Grobler, Managing Director of Senseca South Africa.

The advanced measurement technology from GEONICA and Biral will consolidate Senseca's South African footprint as the leading manufacturer and supplier of specialised environmental measurement instrumentation."

GEONICA has long been known for its advanced data loggers and remote platforms for data and image acquisition and transmission which are compatible with an extensive range of sensors, enabling the measurement of meteorological, hydrological, physical and environmental parameters.

Biral's sensor technology delivers accurate and reliable weather monitoring data, which is critical in certain sectors. The sensors measure key meteorological phenomena such as precipitation, visibility, and lightning activity, which can assist in safety and operational efficiencies across various infrastructure and public environments. □

A step up in quality measurement for sustainable packaging

Valmet has expanded its IQ Quality Control System (QCS) with the launch of four new IQ measurements to measure raw material components, colour, and ash content, accurately. The new measurements allow producers of packaging and nonwoven materials to maintain the desired product quality and, at the same time, further optimise raw material usage, resulting in increased resource efficiency and reduced carbon footprint.

"Valmet IQ is a leading brand in the industry, and this launch demonstrates our ongoing commitment to developing automation technology to meet customers' needs in a wide range of industrial processes," says Mikko Viitamäki, Business Manager, Quality Management Solutions, Automation Systems business line at Valmet. "The new products bring laboratory accuracy to online measurements. For example, our spectrometer measurements provide new opportunities in measuring functional coatings such as bio barriers, adhesives, and polymers," he says.

Optimising material usage

Valmet IQ Transmission Spectrum Measurement and Valmet IQ Reflection Spectrum Measurement provide direct, online methods for accurately measuring the proportions and weights of raw materials – such as fibres, water, binders, adhesives, and polymers – using non-contact and non-radioactive technologies. They enable

customers to optimise material usage, reduce production costs, and significantly lower their carbon footprint.

The measurements can be applied to a wide range of use cases – nonwoven, extrusion coating, laminating, plastic film manufacturing, and paper and board production. They assist in enabling the transition to bio-based coating materials, reducing plastic usage, and supporting more sustainable packaging solutions.

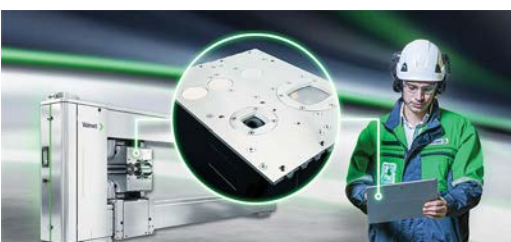
Enhancing quality and reducing waste

Valmet IQ Colour Measurement uses advanced LED technology to deliver precise reflectance spectrum measurements for paper and board applications, ensuring faster on-spec quality and reduced startup waste. It detects the detailed effects of furnish, paper dyes, and brightening agents, resulting in more accurate and stable colour uniformity across different paper grades.

Valmet IQ Total X-ray Measurement offers robust and easy-to-calibrate sensor technology for total ash measurement in paper manufacturing. Additionally, the solution can effectively measure glass content in fibreglass and deliver non-nuclear basis weight measurement for nonwoven materials, as well as coat weight measurement for speciality paper. It ensures real-time process control and proactive issue detection, reducing downtime and minimising waste.

The customisable Valmet IQ Quality Control System consists of a scanner, a wide range of online measurements, advanced controls, and applications. It supports optimal end-product quality and production processes. □

Valmet has expanded its IQ Quality Control System with the launch of four new IQ measurement technologies to measure key factors accurately.



Celebrating a decade in Africa

Pepperl+Fuchs is well-known by customers around the world as a pioneer and innovator in industrial sensors and explosion protection. Founded by Walter Pepperl and Ludwig Fuchs in 1945, the company has grown to more than 80 subsidiaries globally, with the South African operation having been established a decade ago as part of a long-term strategy to develop the African market.

“When we opened our doors 10 years ago,” says Marc van Pelt, MD of Pepperl+Fuchs South Africa, “our aim was to forge closer links within our network in Africa, to be nearer to our customers in order to provide a better service. Just as our founders almost 80 years ago cared strongly about their customers, so do we. We are proud of our company’s heritage and legacy of consistent achievement, innovation and the close relations that have been built with our customers.”

In addition to servicing customers in South Africa, Pepperl+Fuchs has established distributors in sub-Saharan Africa and North Africa with ‘gravity centres’ in South Africa and Morocco. From day one, the company supplied its industrial sensors and explosion protection equipment to a wide range of industries including the automotive industry, mining, oil & gas, and others.

Its significant growth in Africa, in numbers as well as in local presence and support, is a reflection of the company’s success. “Our view a decade ago was that the African continent, among all the world’s continents, was the ‘last giant waking up.’ Although this waking up has been more complex and slower than in other regions,” van Pelt says, “we believed at the time, and still do today, that it’s one of the new economic powerhouses of the future. Pepperl+Fuchs chose to be part of that process by establishing a foot on the ground in South Africa.

“With the population in Africa expected to surpass two billion people by 2050, there’s a vast untapped market for goods and services. Africa is a crucial supplier of natural resources needed to develop the global economy further, especially when one considers how much in the way of metals and minerals, and oil and gas is used in today’s manufacturing processes to produce consumer goods. There is also the growing potential in agriculture linked to population growth and, with regard to renewable energy, Africa has enormous wind and solar energy potential. Via transformation towards green hydrogen and green ammonia, that energy potential can be exported to other parts of the world where there is a need for more energy,” van Pelt continues. “As the world is evolving into an ‘all-electric society’, Africa will play an important role as a provider of clean and renewable energy resources in the future.”

Pepperl+Fuchs believes that rapid technology adoption in various industries presents an opportunity for innovation and optimised customer efficiency. “Automation is key in all the industries mentioned and we chose to be part of this enormous endeavour,” says Van Pelt.

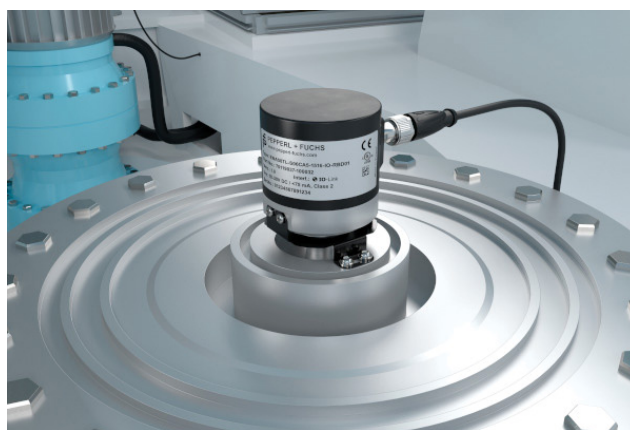
With a focus on adding value to the South African economy, Pepperl+Fuchs is proud to be sponsoring students who are pursuing careers in engineering. In addition, the company is

committed to diversity and inclusion in its workforce, helping to create a culture in which every person feels respected and valued so they are fully engaged and thrive because they feel they belong.

As Pepperl+Fuchs celebrates 10 years in Africa, the company extends its gratitude to its employees, corporate management and customers for their loyalty and support and the company looks forward to the next decade of further success as it strives to assist customers across Africa with solutions that will take their businesses forward. □



Marc van Pelt, MD,
Pepperl+Fuchs South
Africa.



A rotary encoder from Pepperl+Fuchs.

For more information visit: www.pepperl-fuchs.com

Site safety assessments for nuclear power stations

Eskom's Koeberg nuclear power station was recently licensed to operate its Unit 1 for another 20 years. SRK Consulting played a role in assessing site safety and updating the site investigation reports to prepare the Site Safety Report required by the National Nuclear Regulator in support of the licensing application.

According to Derry Holmes, Principal Consultant at SRK Consulting, these studies were part of a range of updates undertaken by SRK, which are required to be conducted every five to ten years. The work related to Eskom's Duynefontyn site, where Koeberg is located.

"Our work for Eskom included addressing comments by the National Nuclear Regulator (NNR) on the previous version of the Duynefontyn Site Safety Report (SSR), as part of the long-term operational licence application for Koeberg," Holmes says. Koeberg's Unit 1 is one of around 120 reactors worldwide that continue to operate safely beyond their initial 40-year life. (Eskom's application to extend the operating licence for Unit 2 at Koeberg, following extensive, recently completed upgrades, is currently with the NNR, awaiting a decision.)

Stringent standards

Nuclear projects are governed by strict local and international quality and safety standards, requiring a wide variety of aspects to be monitored, analysed and reported. SRK's work included technical studies in the fields of hydrology, geohydrology, geotechnology, and meteorology. It also looked at land, water and sea use, ecology, demography, water supply, as well as transport routes, and nearby industrial and military facilities.

"Much of the work is conducted by our in-house professionals in specific disciplines, and other aspects are contracted out to specialist associates," Holmes says. "Town planners, for instance, conduct the investigations on demography, land use, water use, adjacent sea use, and nearby transportation, industrial and military facilities."

He explains that the whole life of the nuclear plant must be considered, so it is important to be able to forecast population growth and movement over this expected lifespan.

"One of the reasons why this data is relevant is because of the plant's potential radiological impact," he notes. "In addition, for purposes of emergency planning – such as determining an appropriate transport model for evacuation – planners need to know how many people are likely to be in the area in future decades."

Safe operation

Using the concept of 'pathways to humans', the specialists must consider all the possible ways that people can be

exposed to radiological impact – through proximity, the food chain, water or other channels. The regulator is then in a position to ensure that the plant will continue to operate safely at that geographic location.

While this work considers the potential radiological impacts of the plant on its surroundings, the site safety investigation also considers the impacts of the surroundings on the plant and its safe operation.

"These aspects include the geology and geohydrology of the ground on which the plant is built, as well as seismic risks to the integrity of the operation," Holmes says. "This extends as far as identifying air traffic routes, considering the potential for aircraft-related accidents. The big question to answer with all this data is whether the environment poses a risk to site safety for the duration of the plant's operational lifecycle."

Many moving parts

In the face of identified risks, the studies also consider whether there are any impediments to creating an effective emergency plan – so that people can be evacuated from the area in the event of an incident. This includes considering the existing transportation infrastructure, as well as likely future scenarios taking account of forecast economic growth and urbanisation.

"The planning of nuclear power stations requires the gathering of considerable data and intensive engagement with stakeholders, including local government, is essential," Holmes says. "The planners need to understand the spatial development frameworks of municipalities or metros and there must be agreement between parties about what happens in the future."

This is because the power station must be able to make reasonable forecasts of where infrastructural and urban development is likely to take place in the coming decades. And it needs to stay abreast of changing plans – if the local government changes its plans, for example, in a way that could have an unexpected impact on the power station.

SRK has been involved in site safety assessments and monitoring of sites for planned nuclear power plants for over 18 years, Holmes says. Its work includes geohydrological water monitoring where the levels and quality of water are checked in dedicated boreholes, as well as meteorological monitoring of factors like temperature, wind, solar radiation and rainfall. The ecological aspects of an SSR can also benefit from information originally gathered for a project's Environmental Impact Assessment (EIA). "While the EIA assesses how the power station might impact the ecology, the SSR assesses how the ecological environment may affect the running of the plant," Holmes highlights. □

For more information visit: www.srk.com/en



SRK Consulting was involved in assessing site safety for Eskom's Koeberg nuclear power station to support the licensing of Unit 1 for continuing operation.

Effective alarm management for safe operations

In industrial and manufacturing facilities, alarm systems are essential to maintaining a safe working environment, protecting assets, enhancing operational efficiency, ensuring compliance, and monitoring environmental conditions. Their multifaceted role reflects their importance in industrial operations today. An efficient alarm management system brings many business benefits, including lowering operational costs by reducing safety incidents.

Here, Neels van der Walt, Senior Business Development Manager at Iritron, presents a closer look at alarm management software that supports effective alarm management.

Alarm systems at an industrial facility are instrumental in alerting plant operators of process safety issues and preventing incidents, but the systems often become ineffective when alarm overload or alarm fatigue result in inadequate responses to alarms.

Plant operators often face an overwhelming number of alarms, especially when multiple alarms are triggered at the same time, an occurrence known as alarm flooding. This makes it difficult to identify which alarm requires immediate attention and can lead to critical alarms being missed. Paired with poor decision making, this can result in serious safety failures, damaging to plant and people.

Using multiple technologies without a consolidated alarm management system and database further complicates incident tracking and response, exacerbating the challenges associated with alarm management.

Software solutions

Recognising these challenges, the effective management of alarm systems can be achieved by implementing suitable software, such as the ProcessVue Alarm Management Suite. This is a comprehensive solution designed to enhance operational intelligence and improve decision making in control rooms.

The suite comprises three main components. The Sequencer is responsible for the collection of alarm messages and event information from multiple disparate systems and consolidating the information into a single database. Collectors are available for most industrial control systems.

The Analyser provides comprehensive off-the-shelf functionality for alarm analysis, including alarm flood analysis, fleeting and chattering alarm analysis, operator response analysis, stale alarm analysis, time in alarm analysis and KPI summary reports on compliance with the various international alarm standards.

The Guardian integrates a master alarm database and Management of Change functionality into a single application, facilitating alarm rationalisation and documentation in a collaborative environment.

Other features include customisable dashboards, automated reporting, holistic real-time views, incident investigation reports and the notification of critical alarms. When compared to other systems available, van der Walt says the ProcessVue Alarm Management Suite stands head and shoulders above the rest.

The suite is designed to meet the requirements of various industries, including oil and gas, power generation, pharmaceuticals and general manufacturing operations.

Compliance with global standards

By adopting effective alarm management solutions, industrial operators can also ensure safe operations and useful alarm alerts. The ProcessVue Alarm Management Suite is designed to align with internationally recognised standards such as ISA 18.2 and EEMUA 191, which are key to establishing best practice in alarm management.

Since its introduction, the ISA 18.2 standard has transformed alarm management, emphasising the need for a structured approach through the alarm management lifecycle. This includes stages such as alarm philosophy development, rationalisation and performance monitoring. By adhering to this standard, organisations can systematically evaluate their alarm systems, ensuring that alarms are justified, prioritised, and effectively managed throughout their lifecycle. The structured methodology enhances operator response to alarms and reduces the potential for alarm fatigue and overload.

Similarly, EEMUA 191 provides guidelines for alarm systems in industrial environments, focusing on the importance of reducing nuisance alarms and improving overall system performance. Compliance with EEMUA 191 ensures that alarms are meaningful and actionable, contributing to better decision making and operational safety.

Further benefits

Beyond compliance, implementing ProcessVue offers organisations further benefits. By prioritising critical alarms, operators can focus on the alarms that matter most, enhancing overall safety protocols within their facilities.

With a centralised database, operators can review alarm history and analyse alarm patterns over time to identify trends. Understanding these trends enables organisations to address the underlying issues proactively and makes it easier to identify root causes when incidents occur. The comparison of current alarm performance against historical data also enables operators to measure improvements and identify areas needing further enhancement.

A structured alarm management system that provides for a clearer focus on critical alarms, enables businesses to achieve better safety outcomes and streamlined processes result in fewer interruptions in production. Efficient alarm management thus translates into lower operational costs and fewer incidents contribute to better safety stewardship in the workplace. □

For more information visit: www.iritron.co.za



Modern alarm management software can enhance operational intelligence and improve decision making in control rooms.

Breathalyser testing in the workplace



Rhys Evans, Managing Director at ALCO-Safe.

Alcohol abuse in the workplace poses a significant threat to safety, productivity, and overall company morale. Rhys Evans, Managing Director at ALCO-Safe says, often, the reason companies want to start testing is because they have had an incident or noticed employees arriving at work possibly intoxicated. “Although employers may suspect there’s an issue with alcohol abuse, they generally don’t grasp the full extent of the problem until testing begins. In large companies, the number of positive results is often higher than expected,” Evans says, adding that when repeat offenders are identified this sometimes leads to a high number of dismissals. He says the issue is more prevalent than many businesses realise, as there are high rates of alcohol abuse among the South African population.

Implementing breathalyser testing programmes can effectively mitigate the risks this raises, creating a safer and more efficient work environment. By identifying and addressing alcohol-related issues proactively, businesses can reduce the likelihood of accidents, injuries, and associated legal liabilities. Over time, this leads to substantial cost savings.

The cost of alcohol-related incidents

The financial consequences of alcohol-related workplace incidents can be significant. Accidents, injuries, and property damage result in direct costs and lead to increased insurance premiums, lost productivity, and potential legal battles. With 20% to 25% of injuries in the workplace reportedly involving employees under the influence of alcohol, it’s clear that this should be an area of concern for businesses. Introducing breathalyser testing programmes offers a first step towards addressing the issue and reducing the risk of related incidents and the associated costs.

Far reaching benefits

Beyond the financial benefits of implementing breathalyser testing in the workplace, further gains are reflected in a reduced number of workplace accidents, enhanced productivity, and a positive work environment, contributing to a company’s overall success and wellbeing.

Regular testing helps companies identify employees who

may be under the influence before they cause accidents, significantly reducing the risk of workplace injuries. As well as preventing unnecessary medical expenses and potentially lost wages, this creates a safer and more secure environment for all employees.

The workplace also becomes more productive. Alcohol abuse can lead to increased absenteeism, affecting productivity and morale. By addressing alcohol-related issues, businesses can improve employee attendance and create a more focused and productive work environment. This in turn boosts morale, as a workplace free from the negative impacts of alcohol abuse promotes increased job satisfaction and higher productivity. Furthermore, breathalyser testing can contribute to a positive company image, demonstrating that the company prioritises the safety and wellbeing of employees. This is also valued by stakeholders more widely, including customers, investors, and the community. And as a reflection of a company’s ethical commitment to its workforce, it makes it easier to attract and retain top talent.

Fair and transparent workplace policy

From a legal perspective, breathalyser testing is one of the most effective means to mitigate risk. Where alcohol-related incidents can result in costly legal battles, breathalyser testing programmes provide evidence of a company’s commitment to safety, mitigating the risk of legal liabilities and associated costs.

The successful implementation of breathalyser testing programmes depends substantially on the company having in place a well-defined and transparent policy on alcohol consumption in the workplace. The policy should clearly outline the company’s expectations regarding alcohol use, the consequences of violating these expectations, and the procedures for conducting alcohol testing.

A fair and transparent policy helps to promote a culture of safety, sending a clear message to employees that the company values their safety and wellbeing. A well-defined policy helps to ensure that alcohol testing is conducted fairly and consistently across the organisation and supports due process by outlining the procedures for conducting tests, challenging results, and addressing any disciplinary actions.

Invest in safety today

Evans says to ensure accurate and reliable testing results, it is essential to invest in high-quality breathalyser equipment and consult with experienced providers. They can assist in developing effective testing policies, training employees, and ensuring compliance with the relevant regulations.

Although the initial investment in breathalyser equipment and related services may seem costly, the long-term benefits in terms of cost savings and improved safety can far outweigh the upfront expenses.

Implementing breathalyser testing programmes in the workplace is a strategic decision that can yield significant benefits. By reducing the risk of accidents, injuries, and legal liabilities, businesses can improve safety, enhance productivity, and achieve substantial cost savings. □

Safety for maintenance teams working on heavy equipment

The partnership between Booyco Electronics and SafeGauge provides advanced wireless diagnostic tools which help maintenance teams stay safe when they are working on heavy-duty mining, construction, earthmoving or agricultural equipment. SafeGauge technology enables remote monitoring and testing of critical systems on heavy machinery, reducing the need for workers to be near equipment during hazardous live testing procedures.

Louis Venter, Area Sales Manager at Booyco Electronics, says that by allowing artisans to conduct tests and gather real-time data remotely, SafeGauge tools significantly reduce the risk of injury, and create a safer work environment across operations.

The SafeGauge range of equipment includes various specialised tools designed for different measurement needs. The PT (Pressure Transducer) Series is used to measure pressures in hydraulic and pneumatic systems, and the DI (Dial Indicator) Series is designed for measuring clearance, tolerance and wear on machine components. The TM (Tacho Meter) Series measures fan speeds and other rotating components, the LD (Laser Displacement) Series tracks wear on moving parts and the PR (Push Rod) Series is used to measure displacement between two fixed points.

Venter says all data collected by the tools can be processed

through the Multitool Pro, which allows for real-time generation of reports and graphs. “With its built-in cloud connectivity, the system makes it easy to export or share data instantly, streamlining operations and improving decision-making efficiency,” he adds.

Advantages for equipment owners

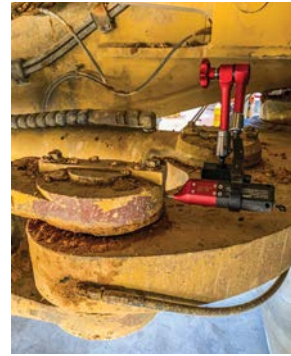
Enhancing artisan safety is one of the main benefits of SafeGauge equipment. “Heavy-duty machinery in the mining and construction industries can present significant risks during maintenance or diagnostic processes, particularly when it involves hydraulic systems or high-pressure environments,” Venter says. “SafeGauge’s wireless system allows for the tasks to be performed remotely, so workers don’t need to be exposed to the danger of moving parts or sudden pressure releases.”

In addition to safety improvements, SafeGauge contributes to increased operational efficiency. By enabling real-time monitoring and remote diagnostics, equipment issues can be identified and addressed faster, reducing unplanned downtime and preventing costly failures. This proactive maintenance approach helps to keep operations running smoothly and extend the life of key machinery components, reducing the need for expensive replacements.

Advantages for heavy equipment operations

“For businesses in mining, construction, forestry, agriculture and earthmoving, where operational continuity is crucial, SafeGauge’s ability to deliver timely diagnostics and maintenance insights is especially valuable. It allows maintenance teams to perform their duties more effectively, ensuring equipment remains in optimal condition,” Venter says. “This results in higher productivity and lower maintenance costs, adding value to day-to-day operations as well as long-term capital investment.”

“As a distributor for SafeGauge in southern Africa, Booyco Electronics offers local operations access to this world class safety and efficiency solution, helping companies meet stringent safety standards and drive operational excellence in even the most demanding environments,” he says. □



The wireless system eliminates the need for workers to be close to large machines during potentially hazardous testing procedures.



SafeGauge technology enables monitoring and testing of critical systems on heavy machinery from a safe distance.

Ball valves for oxygen applications

Following a comprehensive examination by Germany’s Federal Institute for Materials Research and Testing (BAM), GEMÜ BB02, B22, B42 and B52 ball valves have been deemed “suitable for use with oxygen”. This marks a valuable addition to the existing range of products, which already includes globe and diaphragm valves as well as butterfly valves, suitable for use with oxygen.

The ball valve seals were examined in strict compliance with DIN EN 1797 and ISO 21010, and clear conditions for safe use were defined during this process. This means that GEMÜ BB02, B22, B42 and B52 ball valves are suitable for use with gaseous oxygen provided the operating temperature does not exceed 60°C and the maximum operating pressure is 30 bar. PTFE seals and O-rings made from fluorinated rubber (FKM)

are used as the seal materials. GEMÜ customers can order the ‘O’ version of the ball valves specifically for use with oxygen.

BAM emphasised the need for particular caution when handling oxygen. Because of this, all media wetted components in the ball valves for use with oxygen are carefully cleaned. Both the seal materials and the auxiliary materials such as lubricants and screw locking agents comply with the strict regulations.

With these ball valves, valve specialist GEMÜ offers another safe solution for handling oxygen. The result of the BAM examination confirms the quality and reliability of the special ball valves and reflects GEMÜ’s commitment to customer safety. □



The GEMÜ B22 ball valve.

The future of jobs – new opportunities call for urgent upskilling

In early January, the World Economic Forum (WEF) published its Future of Jobs Report 2025. The report suggests that job disruption will equate to 22% of jobs by 2030, with 170 million new roles set to be created and 92 million displaced, resulting in a net increase of 78 million jobs. It points to technological advances, geoeconomic fragmentation, economic uncertainty, demographic shifts and the green transition – individually and in combination – as the main drivers expected to reshape industries and professions worldwide and transform the global labour market by 2030.

The *Future of Jobs Report 2025*^[1] brings together the perspectives of over 1 000 leading global employers, collectively representing more than 14 million workers across 22 industry clusters and 55 economies from around the world, to examine how these macro trends impact jobs and skills, and the workforce transformation strategies employers plan to embark on in response, across the 2025 to 2030 timeframe.

The report finds that the skills gap continues to be the most significant barrier to business transformation today, with nearly 40% of skills required on the job set to change and 63% of employers already citing it as the key barrier they face. Technology skills in AI, big data and cybersecurity are expected to see rapid growth in demand, but human skills, such as creative thinking, resilience, flexibility and agility, will remain critical. A combination of both types of skills will be increasingly crucial in a fast-shifting job market.

Frontline roles and essential sectors like care and education

are expected to see the highest job growth by 2030. Advances in AI and renewable energy are reshaping the market – driving an increase in demand for many technology-focused or specialist roles and driving a decline for others, such as graphic designers.

“Trends such as generative AI and rapid technological shifts are upending industries and labour markets, creating unprecedented opportunities and profound risks,” said Till Leopold, Head of Work, Wages and Job Creation at the World Economic Forum. “Businesses and governments need to work together, invest in skills and build an equitable and resilient global workforce.”

The job market in 2030

Frontline roles, including farmworkers, delivery drivers and construction workers, are expected to see the largest job growth in absolute terms by 2030. Significant increases are also projected for care jobs, such as nursing professionals, and education roles, such as secondary school teachers, with demographic trends driving growth in demand across essential sectors. At the same time, advances in AI, robotics and energy systems – notably in renewable energy and environmental engineering – are expected to increase demand for specialist roles in these fields. Roles such as cashiers and administrative assistants remain among the fastest declining but other roles are also affected as generative AI rapidly reshapes the labour market.

The skills gap

The report indicates that the skills gap continues to be the most significant obstacle to business transformation in response to global macro trends, cited by 63% of employers as a main barrier to future-proofing their operations. If the global workforce were represented by a group of 100 people, 59 are projected to require reskilling or upskilling by 2030 and, among them, 11 are unlikely to receive it; this translates to over 120 million workers at risk of redundancy in the medium term. While technology skills in AI, big data, networks and cybersecurity are expected to see the fastest growth in demand, human skills such as analytical thinking, cognitive skills, resilience, leadership and collaboration will remain critical core skills. A combination of both skillsets will increasingly be required by many growing jobs.

AI and upskilling

AI is reshaping business models, with half of employers



Jobs expected to see the biggest growth and decline by 2030

globally planning to reorient their businesses to target new opportunities resulting from the technology. The most common workforce response to these changes is expected to be upskilling workers, with 77% of employers planning to do so. However, 41% plan to reduce their workforce as AI automates certain tasks. Almost half of employers expect to transition staff from roles exposed to AI disruption into other parts of their business, an opportunity to alleviate skills shortages and reduce the human cost of technological transformation.

Given the rapid growth of emerging technologies, business leaders, policymakers and workers will need to work together to ensure workforces are ready and to reduce risks of unemployment across sectors and geographies.

Beyond technology: economic, demographic and geoeconomic shifts

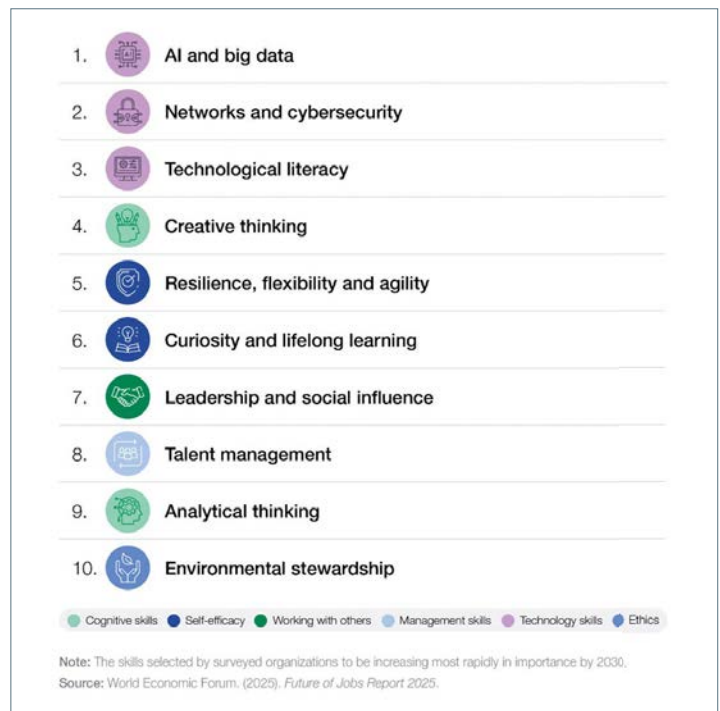
The rising cost of living is another key factor driving labour market change, with half of employers expecting it to transform business models. While global inflation has eased, price pressures and slower economic growth are projected to displace six million jobs globally by 2030. These challenges are increasing demand for resilience, agility, flexibility and creative thinking skills.

Demographic shifts also play a part in reshaping labour markets, with ageing populations predominantly in higher-income countries driving demand for healthcare roles and expanding working-age populations in lower-income regions fuelling growth in education professions. Workforce strategies focused on improving talent management, teaching and mentoring skills are essential to bridging these gaps.

Geopolitical tensions are a top concern for 34% of businesses, while trade restrictions and industrial policy shifts transform many more, with some companies planning to adapt through offshoring and reshoring strategies. These pressures are also increasing demand for skills such as cybersecurity.

A need for urgent action

Addressing the sweeping changes outlined in the report requires urgent and collective action across government, business and education sectors. Key priority areas include bridging skills gaps, investing in reskilling and upskilling initiatives and creating accessible pathways into jobs and skills that are seeing fast growth in demand. By prioritising equitable and inclusive workforce transitions and strategies – and supporting workers through these transformations – stakeholders can build a resilient and adaptable workforce that is prepared to thrive in the jobs of tomorrow. □



The top 10 skills that will see fastest growing demand by 2030.

The World Economic Forum is actively addressing the challenges raised by the *Future of Jobs Report 2025* through specific focused programmes. The Reskilling Revolution^[2] aims to equip one billion people with better education, skills and economic opportunities by 2030, creating scalable solutions for workforce transformation. The Jobs Initiative^[3] engages government, business and civil society to prepare workers for dynamic job transitions, improve job quality and harness the potential of AI and green technology.

References

[1] *The Future of Jobs Report 2025* :

<https://www.weforum.org/publications/the-future-of-jobs-report-2025/>

[2] *The Reskilling Revolution*:

<https://initiatives.weforum.org/reskilling-revolution/home>

[3] *The Jobs Initiative*:

<https://initiatives.weforum.org/jobs-initiative/home>

For more information visit: www.weforum.org



Mervyn Naidoo,
Group CEO, ACTOM.

Locally manufactured solutions for infrastructure development

Against the background of South Africa's urgent need for infrastructure development in critical sectors, Mervyn Naidoo, Group CEO at ACTOM, calls for project procurement to prioritise local manufacturers, looking beyond pricing alone to the longer-term cost and other benefits.

Infrastructure plays a fundamental role in driving growth and economic development. In South Africa, this is evident particularly in critical sectors including energy, logistics and water.

The country is currently facing a significant infrastructure backlog in its electricity supply sector and requires substantial investment to expand infrastructure across all elements of generation, transmission and distribution. Development projects of this nature rely on specialised equipment, such as towers, transformers, high voltage equipment, switchgear, electric motors, alternators, turbines, and associated products, some of which are imported.

Additionally, South Africa is currently experiencing a logistics crisis as it is unable to transport the required volumes of commodities to its ports for export. Consequently, as a country, we are missing out on opportunities for economic growth due to inadequate and poorly maintained infrastructure in the energy and logistics sectors – and deficiencies in the water sector are manifesting similarly.

There is thus a massive need for a capital injection to fix some of these fundamental backlogs. And it is important to recognise that the capabilities are available in the country to manufacture some of the required infrastructure locally. Only where local capacity becomes saturated, or the local industry lacks the capability to manufacture some of the required equipment, should we be looking at importing it from overseas markets.

Expanding local capacity

In such cases, it is key that instead of simply importing, South Africa should rather look at encouraging both local and foreign original equipment manufacturers (OEMs) to invest in expanding local capacity and ensure technology transfer and localisation.

Price should not be the only adjudication factor in buying locally made versus imported products. Life cycle cost considerations are significant in buying local. Localisation provides for 'cradle to grave' support which, in turn, enables optimised plant availability due to aftermarket support and thus delivers optimal return on investment.

This is evident when, for instance, we look at Transnet's historical locomotive procurement programmes versus the more recent 1064 procurement initiative. The previous procurement programmes, which supported localisation extensively, have fleets that are still functional. By comparison, in programmes where procurement was not localised in more recent times, there are currently a high number of new locomotives that are out of service, as is the case with part of the Transnet 1064 procurement programme. The

lack of localisation on elements of that contract is one of the major contributors to the country's current lack of locomotive capacity. Localisation would have facilitated spares availability and aftermarket support.

On the home front, local companies should strive towards process efficiency and product development to ensure they can make products that compete against imports. Where local manufacturing is viable, it is crucial that project owners and developers should maximise localisation.

Where products are imported, we should partner with foreign suppliers, especially in areas where local companies can add value through assembly or in providing basic components. However, local procurement practices should prioritise South African manufacturers, enabling reduced logistics demands and working capital costs, with the added benefit of aftermarket support.

Wider challenges

A further consideration is that spare parts will typically not be localised for imported products, and this can pose significant challenges related to the unavailability of components needed for aftermarket support. It could result in extended plant downtime, reducing plant availability, and increased costs stemming from a reliance on imported components and spares.

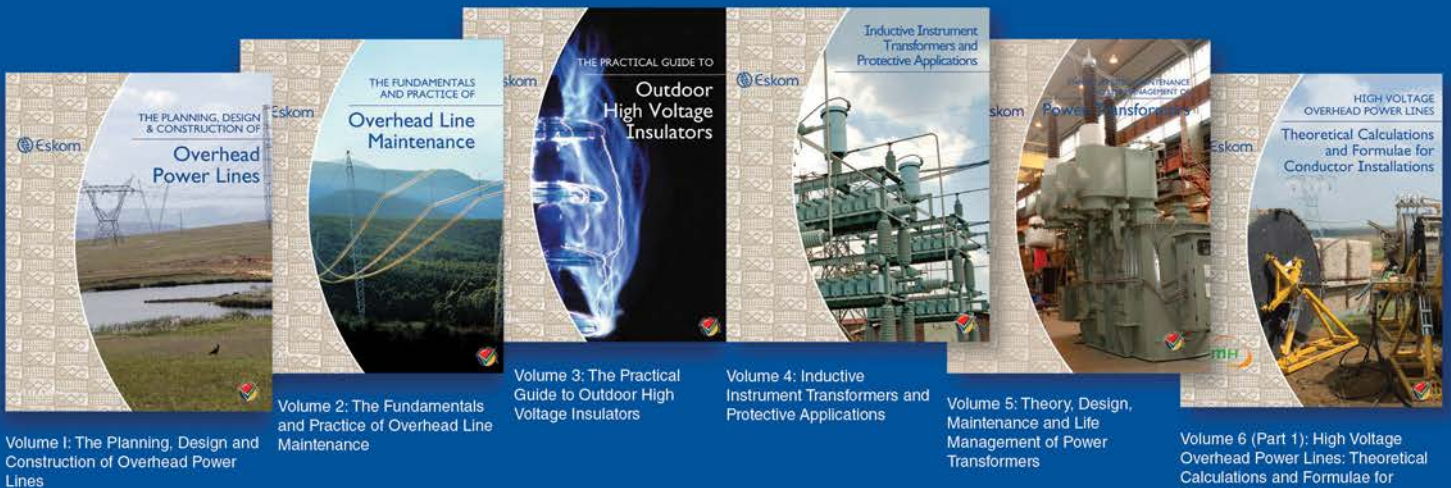
This could force local companies to stock up on spares, pushing up working capital costs due to the need to invest in inventory to avoid long lead times related to the import of spares. However, when companies source a product locally, they can depend on a vertically integrated supply chain that would secure spares availability and support in the local market.

In the bigger picture, imports result in unemployment and contribute to deindustrialising the South African economy, which leads to a loss of critical skills in areas such as engineering, development and innovation. Over time, this unfolds into greater unemployment, poverty and social challenges as more people become dependent on social grants. Furthermore, when there are fewer economically active people, government sees less revenue in terms of taxes, and it is detrimental to the growth of the country's gross domestic product and the broader economy.

Instead of importing, South Africa should leverage its significant need for infrastructure to localise production for infrastructure development. This in turn will enable the upskilling of people, the transfer of technology, as well as the evolution of technology, engineering and competence. It will enable us to grow our economy and contribute to a better South Africa. □

For more information visit: www.actom.co.za

The Eskom Power Series was conceived in response to the continuing worldwide loss of critical technical skills and experience. The aim of the series is to promote international best practice, including experience accrued by Eskom over the years, as a guide and legacy and to serve as a source of reliable, reputable and highly technical information.



Volume 1: The Planning, Design and Construction of Overhead Power Lines

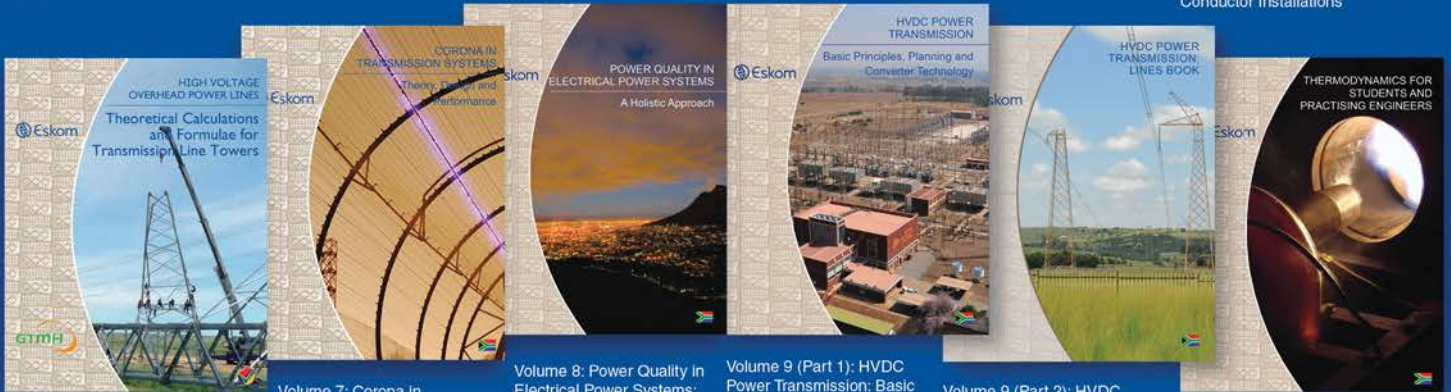
Volume 2: The Fundamentals and Practice of Overhead Line Maintenance

Volume 3: The Practical Guide to Outdoor High Voltage Insulators

Volume 4: Inductive Instrument Transformers and Protective Applications

Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers

Volume 6 (Part 1): High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Conductor Installations



Volume 6 (Part 2): High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Transmission Line Towers

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Volume 13: Applied System Dynamics with South African Case Studies



Volume 1: Procurement Management Key Concepts and Practices

Based on the success of the Eskom Power Series and the Eskom Leadership & Management Series, the Professional Development Series was created. It aims at developing various professions within South Africa so that large state-owned enterprises and the private sector can grow and facilitate job creation in the country. Unlike the Power Series, both the Eskom Leadership & Management Series and the Professional Development Series have a broad readership, including those residing in the private sector, State Owned Companies (SOCs) and academic institutions.

The Eskom Leadership & Management Series was introduced by Eskom at the request of readers and stakeholders of the Power Series who felt that the series should be expanded to include non-technical topics. These topics are often not well understood by technical practitioners and can pose a risk to the sustainability of their businesses. To date, the Power Series team, with assistance from experts in the various fields, has produced two volumes.



Volume 1: Mentorship and Coaching

Volume 2: Winning with People ... Insights for Leaders and Organisations

Eskom has also published: GENERATION, TRANSMISSION AND DISTRIBUTION: A large Southern African utility. This is an introduction to the technology that has developed, over time, in response to growing demand in the electricity utility industry in South Africa. It provides a 'soft-landing' for those who need, or want, to engage with the technology in a large electricity utility.

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