FEATURES:
Industry 4.0 + IIoT
Energy management + energy efficiency
Measurement + instrumentation
Safety of plant, equipment + people

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New Automation Technology **BECKHOFF**

Growing pressure to improve sustainability and operational efficiency is forcing manufacturers to adopt digital transformation. VEGA understands the concerns this raises and offers a practical solution in process instrumentation with the VEGABAR Basic pressure sensors.
(Read more on page 3.)

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Managing your resources for future returns

As we watch in some wonder the world becoming an increasingly interesting place, we dare not take our eye off the ball that is in our field of play.

This month we focus, as always, on critical topics that require your attention, as you do all you can, within the constraints of the playing field, to optimise your process and system.

We feature: Industry 4.0 + IIoT, Energy management + energy efficiency, Measurement + instrumentation, and Safety of plant, equipment + people.

These topics are intertwined – although they are not always understood in that way.

But consider optimising what you do. This is never easy, and the constraints are many and varied. However, consider how each of these aspects of plant operation contributes to your goal of being the best of breed.

Although we see some of the challenges we face in this part of the world beginning to seem like one step forward, and two steps back, we absolutely need to redouble our efforts, focusing on doing all that we can, better.

At this time there is also much noise around the risk of investment – which is a sad observation given the deep challenges in this economy and our real need for serious investment. But there are 'green shoots' beginning to show in some areas – many born of necessity.

It is therefore appropriate to evaluate the benefits that can be accrued by reviewing the way we measure and collect data on the plant, how we interpret that, and how we can use the information to improve the way we operate.

Although common knowledge, it is critical to emphasise that the less we waste, the more we put on the bottom line – which points to better measurement, management and usage of resources and raw materials, optimised delivery and storage, and using the most appropriate technologies to provide the information you need to better run the plant.

Using the smartest means of managing your plant and your process allows you to get a real handle on what your input costs are, where there is low hanging fruit to be picked, and even how to change the way you run the show.

I fondly recall when no one really paid any attention to the input cost of energy: it was simply too cheap to worry us. And yet, had we put a strong focus on energy efficiency from day one, we'd be reaping the rewards now.

Look out for analogous situations in the plants you run today – where are the opportunities? Without a doubt, emphasis placed on optimisation now will allow you to reap the rewards in the future.

Enjoy this edition of *Electricity + Control*. I have mentioned only an iota of the importance of the topics considered this month – but reflect on the relevance of each, and how they can be leveraged to improve your bottom line. Investing now can save you in the long run.

Ian

Ian Jandrell

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

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Pressure sensors without the price tag panic

Digital transformation is no longer a futuristic concept – it's the present reality for manufacturers worldwide. Concerns like cost, complexity, and compatibility with existing infrastructure often make these upgrades feel like an impossible challenge. Many see process instrumentation as an expensive exercise with little immediate return on investment. With growing pressure to improve sustainability and overall operational efficiency, businesses are being forced to rethink their approach. VEGA understands the reality of industrial transformation and offers a practical solution with the VEGABAR Basic series of pressure sensors

Making the transition without the growing pains

The VEGABAR Basic series has been developed to provide manufacturers with an economical yet highly effective solution for pressure measurement. Measuring gases, vapours, or liquids, these pressure sensors offer the precision required for modern manufacturing without the need for extensive modifications to existing systems. The option of a ceramic measuring cell or a fully welded metallic measuring cell ensures compatibility across various industries, allowing for smooth integration into new and established processes.

One of the most significant advantages of the VEGABAR Basic series is its ease of use. Many manufacturers delay upgrading instrumentation due to the perceived need for costly training or complex setup procedures. VEGA eliminates these concerns by offering intuitive, user-friendly sensors that require minimal investment in training. This translates into reduced installation effort, leaner stock-keeping and, in turn, significant time and cost savings.

A sensor for every application

The VEGABAR 18 and VEGABAR 19 serve as universal pressure sensors designed to meet a wide range of applications. With a 4-20 mA output, these sensors provide straightforward integration into existing systems. They can accurately measure gases, vapours, and liquids at temperatures up to 100°C, making them a reliable and economical choice for process industries. The key difference between the two is in the measuring cell: the VEGABAR 18 features a ceramic measuring cell, while the VEGABAR 19 is equipped with a fully welded metallic measuring cell, providing flexibility based on process requirements.

For applications requiring hydrostatic and process pressure measurement, the VEGABAR 28 and VEGABAR 29 offer an advanced yet affordable solution. Capable of handling gases, vapours, and liquids, these sensors provide reliable readings, including in hygienic environments. The VEGABAR 28 features a ceramic measuring cell, whereas the VEGABAR 29's fully welded metallic measuring cell allows for broader application. With Ex approval for hazardous environments and seamless IO-Link connectivity, these sensors can be integrated effortlessly with existing infrastructure, ensuring a smooth transition to digital monitoring without expensive system overhauls.

The VEGABAR 38 and VEGABAR 39 go a step further, incorporating a 360-degree rotatable display and a switching function alongside reliable process pressure measurement. Designed for high accuracy, these sensors contribute to plant efficiency by ensuring maximum overload and vacuum resistance. The VEGABAR 39's metallic measuring cell provides high-performance measurement capabilities with added durability. What sets these sensors apart is their wireless setup and diagnostics, allowing plant operators to configure and monitor them using a smartphone or other smart devices. Easy system integration via IO-Link ensures that manufacturers can benefit from modern instrumentation without needing to abandon their current setups.

Smart instrumentation without the sticker shock

Manufacturers are often wary of the perceived costs associated with upgrading process instrumentation. However, the VEGABAR Basic series is proof that smart sensors don't have to come with an intimidating price tag. These pressure transmitters are designed to be cost-effective and offer excellent value for money. More importantly, they can be integrated into existing systems and are compatible with other manufacturers' instrumentation, making them a practical choice for businesses looking to modernise without unnecessary disruptions.

The VEGABAR Basic series ensures that companies can future-proof their operations, enhance sustainability efforts, and optimise efficiency, all while keeping costs under control. Because smart instrumentation shouldn't be a luxury – it should be a standard that every manufacturer can afford.

The VEGABAR Basic series makes smart manufacturing accessible. Providing pressure sensors to suit a range of applications, it includes: VEGABAR 28, VEGABAR 38, and VEGABAR 39.

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Transforming utilities with AI

Satyajit Dwivedi, Regional Director, EMEAP, Energy Utilities, Mining & Metals, Public Sector, SAS

The global artificial intelligence (AI) in energy and utilities market was valued at USD 10.56 billion in 2023 and is projected to expand at a compound annual growth rate (CAGR) of 22.9% during the forecast period, reaching USD 45.78 billion by 2030[1].

Over the past decade, the utilities industry has undergone significant evolution. The methods for generating, delivering, and using energy have transformed from the practices of the early 2000s. This transformation includes the completion of enterprise resource planning (ERP) rollouts, which have enhanced data processing and integration capabilities. The widespread rollout of smart meters has improved real-time data collection and accuracy in monitoring energy and water usage. Additionally, adopting asset management (AM) systems and customer relationship management (CRM) systems has led (in many cases) to more efficient operations and better customer service.

Central to these advances is the increasing reliance on data, which has enhanced the management of electricity and water access and improved utilities' ability to balance supply and demand. Furthermore, the focus on renewable energy and the integration of distributed energy resources (DERs) have become key in achieving energy security for many countries, and for the transition to sustainable energy systems in industries. The shift towards renewables and distributed resources supports energy security by diversifying energy sources and improving resilience to overcome disruptions.

In addition to these technological and operational advances, changing customer behaviour, driven by economic fluctuations and climate change, presents a critical dimension. Economic ups and downs influence consumer energy consumption patterns and demand for services. Climate change introduces new challenges and pressures for utility operations. Consumers are increasingly seeking sustainable operations and cost-effective solutions, prompting utilities to adapt their power generation and transmission strategies and customer-centric programmes. With the explosion of data from meters and sensors, the adoption of AI is becoming essential to addressing changing demand, optimising energy management, enhancing grid reliability, and supporting the overall energy transition – and at the same time responding to the dynamic landscape shaped by economic and environmental factors.

Challenges of AI adoption

Implementing AI in utilities brings with it multiple challenges, largely due to the diverse and sometimes conflicting understandings of AI across various departments – in business operations and information technology (IT). Each department may have its own interpretation of what AI can achieve, leading to the bypassing of dashboard and reporting needs and potential duplicate demands for AI solutions. These disparate needs and interpretations often prevent the unification of AI efforts within a common strategic context. Without a cohesive approach, different departments may select and implement different

Satyajit Dwivedi, SAS.

AI technologies, resulting in a fragmented and inefficient technological environment. A lack of alignment complicates integration and impedes the overall effectiveness of AI initiatives.

These challenges are exacerbated if there is not a team dedicated to rationalising and consolidating the enterprise's digital footprint. A central team should oversee the standardisation of AI requirements, and the integration of digital resources tailored to specific AI value propositions. Without this, utilities struggle to develop a cohesive AI strategy and architecture. The challenges may be further compounded by the absence of a multi-year AI transformation roadmap, which hinders the ability to plan and execute AI initiatives in a structured and strategic manner. As a result, significant gaps emerge in defining AI use cases and in the lack of a comprehensive AI value framework, impeding the effective deployment and realisation of AI's potential across the organisation.

An AI transformation roadmap

The rationalisation of the digital footprint should provide a clear AI transformation roadmap. It should comprehensively address core initiatives to ensure a robust approach to AI integration into the business processes delivering value to the organisation. Core initiatives are those critical to the utility's primary operations and include revenue protection efforts such as smart collection analytics, reducing losses, including non-technical losses, or minimising energy cost with the use of AI.

Additionally, there should be a focus on the application of AI to enhance the accuracy of short- medium- and long-term demand forecasting and associated peak load management, which are essential to balancing supply and demand. Core applications also extend to grid maintenance through predictive analytics, intelligent spare parts management, and sustainable operations, involving fuel demand forecasting, fuel supply chain optimisation and health, safety and environment (HSE) analytics

With the widely increasing reliance on data, AI can assist utilities to manage their networks more efficiently.

with the aid of AI and drones.

Advanced machine learning techniques can be deployed for non-intrusive load disaggregation (NILD) based energy management and/or demand response management using granular meter or data logger data.

Non-core initiatives, while not directly tied to primary operations, are important for overall organisational efficiency and support. These initiatives include continuous monitoring for spare parts contracting and procurement, and advanced human resources analytics, which help streamline processes and improve cost efficiency. Although they may not impact the core functions of energy and utilities directly, non-core AI applications enhance broader organisational capabilities and support the comprehensive integration of AI. A well-rounded AI strategy would include both core and non-core elements in the AI transformation roadmap, maximising AI's value across all areas of the organisation.

The power of a data-to-decisioning AI platform

Having a data-to-decisioning platform that runs on modern and scalable architecture is key to maximising the strategic capabilities of AI, resulting in the realisation of substantial value across core and non-core areas of utility operations. In core areas, a robust platform can provide AI solutions that deliver accurate large-scale forecasting automation, real-time process or energy optimisation, and intelligent decisioning workflows for department strategies built from AI models. Additionally, it can provide insights from unstructured data, and enable optimised decisions based on scenario planning.

In non-core areas, a robust AI platform supports continuous monitoring for processes such as procurement to payment and recruitment to retirement, which drive operational and cost efficiency.

By leveraging a cloud-native AI platform built on Kubernetes architecture, utilities can integrate and analyse data from diverse sources, enabling a unified approach to addressing strategic and operational challenges. Such a holistic platform empowers utilities to embrace a new era of smart, predictive, and efficient solutions, driving transformative outcomes across their organisations.

The integration of AI in the utilities sector marks a shift towards smarter, more predictive, and efficient operations. As the industry evolves, driven by advances in technology and changing market dynamics, leveraging AI will become essential in navigating the complexities of modern energy and water management. The transformative potential of AI enhances core functions such as resource management, predictive maintenance, and revenue protection, and supports non-core activities like procurement integrity and HR analytics.

By adopting a comprehensive AI transformation roadmap, utilities can align their AI initiatives with strategic and operational goals, supporting a unified approach that maximises value across all areas. With these innovations utilities can adapt to economic fluctuations, climate change, and evolving customer expectations, in turn developing a more resilient and sustainable energy infrastructure. With thoughtful implementation and strategic planning, the utilities sector can unlock new levels of efficiency and effectiveness, driving progress in the transition to a smarter, more connected future.

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A first step in digital transformation for manufacturers

Neels van der Walt, Head of Department Sales and Business Development at Iritron

For manufacturing companies, maintaining and growing the South African manufacturing sector involves navigating significant risks. Digital transformation is reshaping the sector, enhancing efficiency, reducing costs and improving product quality, and those that don't keep up with digitalisation and digital integration in manufacturing operations will fall behind.

With Industry 4.0 tools, smart factory technologies, and an upskilled workforce, manufacturers are driving significant improvements in efficiency and sustainability.

According to PwC's South African Manufacturing Analysis 2024, released in October last year, the South African manufacturing sector is facing increasing pressure to change and adapt, particularly with regard to decarbonisation and the design of circular-economy and sustainable products.

Since the onset of the industrial revolution, basic manufacturing interaction has been human driven, often marred by errors with serious implications, such as downtime, cost overruns, wastage and losses in energy and other resources.

With global competition forcing companies to find ways to optimise production operations and reduce non-value-adding activities, adopting Industry 4.0 tools and smart factory technologies is driving significant improvement in manufacturing efficiency and sustainability.

By implementing Advanced Planning and Scheduling (APS) systems, for example, organisations can facilitate medium-term production planning and detailed scheduling, optimising production schedules and balancing supply and demand. With the integration of advanced algorithms, APS systems can analyse and calculate achievable production schedules, enabling organisations to meet dynamic market demands.

Many South African companies are shifting from traditional time-consuming manufacturing practices to more agile, data-driven approaches that leverage real-time information and advanced analytics. This enhances responsiveness to customer demands by enabling quick adjustments to production schedules.

As a result of experience gained in supporting multiple clients in diverse industries in South Africa with APS solutions, Iritron has found that APS systems are pivotal in assisting manufacturers to adapt to digital transformation. With an integrated approach to production planning and execution, the flexibility these solutions offer allows companies to meet last-minute requests without compromising overall planning control, and so to maintain their competitiveness. This is because it is easy to see quickly, via APS analysis, the impact of changes on the overall schedule, before the schedule is made available to the production plant.

The advanced forecasting capabilities of APS provide for potential bottlenecks to be detected and managed, for lower

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More changes in the cloud ecosystem in 2025

The global cloud ecosystem experienced significant upheaval in 2024 and 2025 is expected to bring more of the same. This is the view shared by Lee Syse, Director of Product and Go-To-Market, and Andrew Cruise, Managing Director, at Routed.

Andrew Cruise, Routed Managing Director and Lee Syse, Director of Product and Go-to-Market (GTM).

Changes in 2024 were driven by factors such as repatriation, sovereignty, and market consolidation. As we move forward through 2025, anticipating further shifts, Syse says readiness, reassessment, and resilience are the watchwords for all players in the cloud ecosystem.

He notes that in 2024, the Broadcom acquisition of VMware probably had the single biggest impact on the cloud ecosystem. "This acquisition caused a major rethink across industries. Although Broadcom is encouraging a view of the right horse for the right course – or the right workload for the right cloud – the changes implemented in the partner market are making customers and partners think more carefully about the cloud," he says.

"And it is not only VMware customers that have had to rethink their strategies and approaches. For partners, the challenge has been around uncertainty over contract terms, and fear over possible price increases."

Syse adds that this has led them to ask whether they will move to other vendors, and whether VMware still makes sense as a technology of choice or does the market footprint they address require that they adopt additional technologies.

"What we faced in 2024 enforced a maturing of people's understanding of cloud and their approach to cloud. You could say the Broadcom acquisition of VMware has shaken up the industry's infrastructure plans; it created an inflection point in the cloud computing and virtualisation space."

The repatriation issue

Andrew Cruise, MD at Routed, notes that there were other considerations in focus in 2024, besides the Broadcom acquisition of VMware. There was also a shift back towards on-premises data management and away from hyperscale clouds.

"We have seen cloud service providers, as well as end customers, resellers, service providers, OEMs, and vendors mature in their thinking about where various clouds fit in. Every global cloud vendor has its own place, as they don't all do the same thing.

"A key trend for 2024 was this realisation that certain clouds are good for certain things and other clouds are not. This was reinforced by the Broadcom acquisition and the changes that have been implemented," Cruise says.

He explains that repatriation is mostly driven by concerns around performance and cost, with many players not getting the kind of value and efficiency out of the cloud that was expected.

"At the same time, fears around who has access to your data also drive this trend. If your data is hosted with a foreign company, can you be certain of its security? Thus, a lack of trust is also a driver of the repatriation trend."

Sovereignty and consolidation

"The concern around cloud and data sovereignty is closely tied to re-

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stock levels to be maintained, while ensuring adequate material availability, and, at the same time, for overall plant throughput to be improved. The reduction in inventory decreases holding costs and waste, and that in turn reduces costs and improves productivity – key factors for sustaining profitability.

However, new technology does bring new challenges, and it is therefore important to upskill workers so that they are equipped and confident to handle new systems – and to develop a digitally-enabled and connected workforce. Many companies still use Excel as the basis for production planning, and the planning process requires a skilled planner who understands the factory processes and operational business environment. The risk with this approach, if the company is fully reliant on an individual planner and his or her knowledge (without a team or backup), is that if he or she is not at work, the planning activity comes to a halt.

We have learned at Iritron that it is important to support clients by digitising and modelling business rules and the 'know how' of skilled planners into an APS solution. This enhances operational efficiency and it addresses the skills gap by automating time-consuming routine tasks, enabling less skilled planners to produce and revise and update production schedules with the aid of technology.

An additional benefit of an APS system is that the production schedule can be shared electronically, with all the people that need to know, within the organisation. Hence the sales department, for example, can view the schedule so it can provide accurate updates on delivery dates to customers. APS systems offer numerous benefits across various industries, particularly in manufacturing, food and beverage and FMCG sectors.

As CEOs confront the complexities of maintaining a competitive edge in the manufacturing sector, leveraging technologies like APS becomes essential. These technologies are fast, smart, scalable and flexible.

With the manufacturing sector continuing to play a significant role in the local economy, and the need to grow the sector substantially, local companies need to adapt to change quickly. The insights gained from real-time data analytics mitigate the risk of lost opportunities and support companies for sustainable growth. By integrating advanced solutions companies are better equipped to navigate the changing business landscape effectively, and to drive success in a complex and challenging environment.

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

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patriation," Cruise continues. "It's a global phenomenon as organisations increasingly focus on what is the right thing is to do regarding cloud hosting – and sometimes the right thing to do is to stay on-premises."

He adds, though, that data sovereignty is about more than where the data resides. "It's also about how your business operates and where the staff sits. For example, do you have any staff based in the US? In the bigger picture, there are a lot of elements of shared metadata that influence your overall approach to data sovereignty.

"We expect data sovereignty to remain a critical focus in 2025, as more legislation is introduced governing this issue, just as we anticipate more consolidation in the market."

He says all indications are that Broadcom wants the cloud service provider market to consolidate. This is something Routed has also encouraged, and it expects to see significant consolidation in the cloud service provider market in 2025.

"Routed had anticipated much of what has unfolded, and we are prepared for the further changes we expect to happen in 2025."

Looking ahead

Syse adds that more changes can be expected not only from a commercial perspective but also from technical and architectural perspectives. These changes will mean businesses in the cloud ecosystem will need to make different commercial decisions if they aim to stay profitable.

"I don't think the disruptions in 2025 are going to differ much from those seen in 2024. Businesses can expect more, and quite dramatic, change," he says. "This will likely include a reassessment from small and large cloud providers as to how they should be doing business, what kind of business they should be doing, who they should be engaging with, and who their end-customers should be.

"Businesses will need to be more independent and use their own critical thinking, rather than following the crowd, or listening to what their vendor says.

"Customers will need to become more self-sufficient, analysing the impact a particular vendor or hypervisor has on their organisation – considering, for instance, what it actually does for their business, and its knock-on effects within the business – and use that knowledge to make a more informed choice."

Syse says, in closing, "This is the real benefit of partnering with Routed: we are always moving ahead, preparing for what comes next. Customers benefit from our forward-thinking approach, readiness for change, and commitment to helping partners and customers navigate the changing cloud landscape."

The Routed cloud platform is vendor-neutral and offers scalable, full or hybrid cloud hosting. Engaging directly or within a channel, Routed delivers cloud and infrastructure solutions to enterprise customers, wholesale partners, resellers and affiliates.

Routed was founded as a cloud provider in 2016, in response to a growing demand for data centre hosting solutions following the rapid growth and penetration of fast, reliable connectivity services in South Africa. It is led by industry veterans with over 35 years of experience in delivering and managing secure cloud and infrastructure solutions, locally and internationally.

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

Preparing data centres for the rise of AI in Africa

Africa, like the rest of the world, is witnessing the reshaping of industries and economies as artificial intelligence and generative AI gain traction. Wojtek Piorko, MD for Africa at Vertiv, says preparing for the complexities of AI demands has become essential for local businesses, and a robust, scalable data centre infrastructure is the foundation on which Africa can build its AI future.

Wojtek Piorko, MD for Africa at Vertiv.

According to Gartner[1], global spending on data centre systems is expected to increase by almost a quarter (23.2%) in 2025, driven largely by artificial intelligence (AI) initiatives. With the right strategies in place, Africa's data centre operators can leverage AI to drive operational efficiency and long-term sustainability, positioning the continent as a leader in innovation and digital transformation.

Vertiv has set out a framework of 'AI Imperatives', which offers organisations on the continent a strategic roadmap to align their data centre infrastructure with the realities of AI's requirements and growing demands on data centres.

Transforming operations for AI

More than the technology itself, AI represents new ways for businesses to innovate. From agriculture to healthcare and education, industries across Africa are finding ways to use AI in their operations. However, this requires a fundamental overhaul of existing data centre operating models and infrastructure.

Piorko says critical infrastructure challenges will likely include: retrofitting existing data centre infrastructure in a transformative way, accommodating growing rack power densities, deploying liquid and hybrid air-liquid cooling, understanding that liquid distribution is as critical as power distribution, and ensuring power availability and intelligent grid interaction.

First mover advantages

Power and cooling systems remain critical challenges for data centres in Africa, especially as AI workloads increase energy consumption and generate significant heat. Overcoming the challenge of the separate management of power and cooling systems can lead to a first mover advantage.

Innovative cooling solutions, such as liquid cooling, are gaining ground globally and are well-suited to Africa's high-density environments. According to the Dell'Oro Group[2], the market for liquid cooling is expected to grow to US$15 billion over the next five years.

Driving efficiency and sustainability

The 'AI efficiency paradox' – which highlights the conflict between AI's mounting computational demands and the urgent need for sustainability in data centre operations – is particularly pronounced in Africa.

Piorko suggests that local energy constraints could mean that concerns around AI's energy-intensive nature require creative solutions. For instance, the integration of renewable energy sources, such as solar and wind, can help to reduce dependency on traditional power grids, as well as lowering operational costs and contributing to sustainability goals.

Embracing change

Turning to AI implementation, a detailed plan is needed to differentiate between calculated risks and reckless decisions. A deep understanding of critical factors plays a significant role in enabling businesses to approach innovation in infrastructure with confidence.

This includes knowing what is technically possible with regard to combining new and existing technologies, how to get the most from existing infrastructure investments when retrofitting for AI, and planning today's AI factory with a view towards future transformation that will be required as densities continue to accelerate.

Planning for Africa's digital growth

Africa's digital future depends on developing infrastructure that can handle increasing density and computational workloads. This requires investment in high-performance computing (HPC) technologies that support high rack densities – expected to exceed 100 kW per rack – and are scalable enough to adapt to the next wave of AI models and applications.

Navigating the AI era in Africa

The path to an AI-enabled future in Africa is not without challenges. Organisations will need to balance legacy infrastructure with new technologies, address power and cooling constraints, and ensure that sustainability remains a priority. However, Piorko says, those who embrace change and strategically align their operations with AI's demands will manage the AI era successfully and can lead Africa into a new age of technological transformation.

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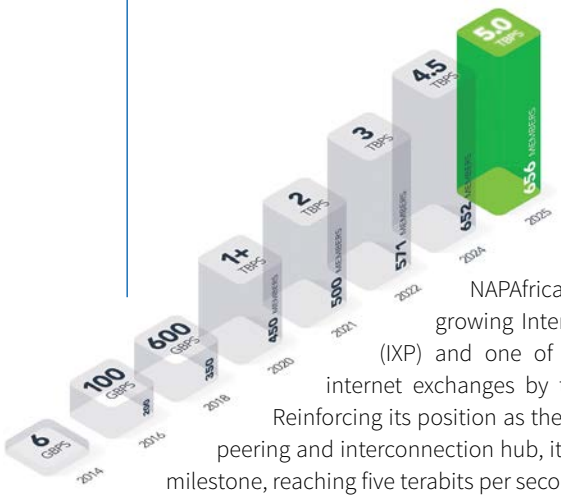
Driving Africa's digital transformation



NAPAfrica, Africa's fastest-growing IXP sees internet traffic reach 5 Tbps

NAPAfrica is Africa's fastest-growing Internet Exchange Point (IXP) and one of the global top ten internet exchanges by total traffic volume. Reinforcing its position as the continent's premier peering and interconnection hub, it has reported a new milestone, reaching five terabits per second (Tbps) of internet traffic.

With over 655 networks peering at its exchange points, NAPAfrica continues to play a critical role in keeping African internet traffic local, reducing costs, and improving network performance.

Key traffic milestones

2016: Traffic peaked at 100 Gbps.
2018: Traffic peaked at 500 Gbps.
2021: Traffic surged to 2 Tbps.
2023: Traffic surpassed the 4 Tbps mark.
February 2025: Traffic reached 5 Tbps.

NAPAfrica has 2 244 physical connected ports and a total connected capacity of 41.5 Tbits.

Ten factors driving growth

- Strategic locations in South Africa

NAPAfrica operates in Johannesburg, Cape Town, and Durban, three of Africa's key internet traffic hubs. In these locations, it serves as a critical interconnection point for regional and international networks.

- Teraco data centres

NAPAfrica is physically hosted in Teraco data centres, Africa's largest carrier- and vendor-neutral data centre operator. Teraco facilitates direct interconnections with over 655 networks, including major ISPs, CDNs, cloud providers, and enterprises, offering a seamless and cost-effective peering experience.

- Presence of major content and cloud providers

The exchange attracts global technology leaders such as Akamai, Amazon, Cloudflare, Google, Meta, Microsoft, and Netflix, enabling direct content delivery and cloud access in Africa. Teraco and NAPAfrica have invested in additional cache servers to cover regional connectivity requirements

- Free peering and cost efficiency

Unlike many global IXPs, which charge for port access, NAPAfrica offers free peering. This enables ISPs, content providers, and enterprises to lower transit costs while improving network performance.

- Expansion of the peering community

Over the past year, NAPAfrica has added more than 40 new peers, including prominent companies like Mimecast, Fortinet, and Tencent, enhancing its peering ecosystem and increasing traffic exchange efficiency.

- Introduction of 400 Gbps interconnection options

In a first for Africa, NAPAfrica now offers 400 Gbps interconnects, accommodating the growing bandwidth demands of content and cloud providers.

- Growth of local and regional networks

Most of Africa's internet traffic was traditionally routed through Europe, increasing latency and costs. NAPAfrica has helped keep African traffic within the continent, leading to improved performance for ISPs, mobile operators, and enterprises, and fostering a more self-sufficient African internet ecosystem.

- Subsea cable connectivity boost

South Africa's strategic position as a landing point for subsea cables like 2Africa, ACE, EASSy, Equiano, METISS, SAT3/SAFE, Seacom, and WACS has bolstered international connectivity. Networks across Southern, East, and West Africa peer at NAPAfrica to access global content efficiently.

- Growth in mobile and broadband internet usage

With Africa experiencing exponential growth in mobile internet and fibre broadband penetration, ISPs and mobile operators increasingly rely on NAPAfrica to support demand for video streaming, gaming, and cloud services.

- Enhanced network visibility and optimisation

NAPAfrica's adoption of the Kentik Network Observability platform provides peering members with critical network insights, allowing them to optimise traffic flows, detect anomalies, and enhance performance.

As Africa's digital landscape continues to evolve, NAPAfrica remains at the forefront of connectivity, providing the infrastructure necessary to support Africa's digital transformation.

Green power for data centres

Teraco, a leading provider of interconnection platforms and vendor-neutral colocation data centres, recently announced that it has signed a power purchase agreement (PPA) with South African integrated energy aggregator NOA, to supply wind powered renewable energy to its data centres.

This follows Teraco's announcement late last year that it had started construction on its own 120 MW solar PV plant in the Free State. The signing of the new PPA with NOA complements its renewable energy programme with the inclusion of wind power. The agreement provides Teraco and NOA with the flexibility to grow renewable energy offtake as both companies evolve to meet increasing demand.

Wind is a key renewable energy resource for data centres, which operate 24/7/365. In South Africa, wind generates power through the night and into the early morning, making it an excellent complementary source of power to solar, which is

Continued on page 11

Systems integrator achieves certified IoT specialisation

Leading hybrid ICT systems integrator and managed services provider, Datacentrix, has achieved the Cisco Internet of Things (IoT) Specialisation. This confirms Datacentrix's expertise in the deployment of Industrial Internet of Things (IIoT) solutions, which empower its clients in industries such as manufacturing, automotive, energy, oil and gas and critical infrastructure, to accelerate their progress in digital transformation.

According to Statista[1], the African IIoT market is expected to maintain a robust annual growth rate of 15.33% between 2024 and 2029, reaching a market value of USD 8.14 billion by 2029. However, with this growth and the widespread adoption of smarter technologies comes an expanding potential attack surface for cyberthreats.

"As the industrial sector increasingly adopts IIoT technologies, cybersecurity and seamless connectivity have become critical concerns," says Andre Froneman, Operational Technology (OT) Solutions Specialist at Datacentrix.

Cisco's 2024 *State of Industrial Networking Report* identifies cybersecurity as the industrial sector's biggest reported challenge, with cybersecurity risks cited as the number one internal barrier to growth. Additionally, 89% of respondents indicated that cybersecurity compliance is critical for their operational networks.

Froneman adds: "Cisco's leadership was further reinforced in the Forrester Wave™ Operational Technology Security Solutions, Q2 2024 report[2], where it was recognised for its 'reliable and comprehensive OT security platform' and 'strong networking capabilities', including a rugged line of hardware designed for challenging environments."

Achieving the Cisco IoT Specialisation required Datacentrix engineers to undergo rigorous training and testing on Cisco's industrial networking and security portfolio, covering key technologies such as its:

- Cyber Vision for comprehensive OT/ICS asset visibility and threat detection
- Secure Equipment Access to enable Zero Trust Network Access for industrial environments
- Catalyst industrial switches and routers for reliable, secure connectivity, and
- IoT solutions for PLC automation and data collection.

"Industrial organisations are eager to harness IoT data to improve efficiency and productivity, but they need to do so without compromising security or operational reliability," Froneman continues. "With our expanded Cisco IoT capabilities, which encompass best-in-class OT visibility, zero trust security, PLC automation and industrial networking solutions, Datacentrix is well positioned to help clients achieve these objectives.

Andre Froneman, OT Solutions Specialist at Datacentrix.

"Cisco's industrial IoT portfolio complements our existing OT and automation expertise. We look forward to leveraging these new capabilities to deliver greater value to our clients as they advance digital transformation in their workspace," he says.

Datacentrix is a Cisco Tier 1 Gold Certified Partner holding additional specialisations in advanced data centre architecture, security architecture, collaboration architecture, and enterprise networks architecture. The company is also authorised to sell enterprise agreements in data centre, cloud, security and collaboration.

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[1]. https://www.statista.com/outlook/tmo/internet-of-things/industrial-iot/africa
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Continued from page 10

generated during daylight hours. The combination enables greater levels of renewable energy coverage.

Bryce Allan, Head of Sustainability at Teraco, says, "The conclusion of this PPA supports our sustainable growth pathway. We appreciate NOA's collaborative approach in complementing Teraco's renewable energy supply and look forward to a long partnership as we journey towards our 100% renewable energy goal."

Karel Cornelissen, CEO at NOA, says, "NOA is proud to deliver its suite of renewable energy products to support Africa's largest data centre operator's ambitious renewable energy goals. Teraco is an industry leader and continues to set the bar high for renewable energy initiatives across South Africa's data centre industry. By aggregating renewable energy from our fleet of generation facilities and third party IPPs, we are well positioned to provide tailored and flexible solutions to help companies, like Teraco, reduce their carbon footprint."

Teraco is aiming for 100% renewable energy to power its data centres.

Digital engineering to create virtual prototypes

Altair, a global leader in computational intelligence, has released Altair® HyperWorks® 2025, a best-in-class design and simulation platform to help in solving the world's most complex engineering challenges. At the forefront of this release is a vision of the future of product development: a zero-prototype world, where design is perfected in the virtual domain before reaching the physical world. By combining the power of artificial intelligence (AI), high-performance computing (HPC), and multiphysics simulation with cloud-based scalability and digital thread connectivity, Altair HyperWorks 2025 is a simulation platform that opens new possibilities for innovation.

"Altair HyperWorks 2025 builds on four decades of Altair's expertise in simulation, design, and optimisation," said James R Scapa, Founder and Chief Executive Officer, Altair. "By integrating advanced simulation technologies with AI and machine learning, automation, open architecture, and a connected digital thread, the platform accelerates design processes, enables scalable cloud collaboration, and empowers teams to deliver smarter, faster, and more sustainable solutions. It is another leap in our vision of democratised computational intelligence."

AI-powered engineering and optimisation

Altair continues to lead with its AI-powered engineering, machine learning, and optimisation capabilities. Physics prediction models powered by new transformer architectures deliver accurate simulations, even with limited or incomplete data. Machine learning models act as solvers, cutting simulation times and improving reliability. AI-enabled reduced order modelling (ROM) enables faster, more precise simulations of nonlinear systems, providing insights early in the design process.

Cloud-based and SaaS solutions

Embracing the shift to cloud-based and SaaS solutions, Altair is democratising access to advanced engineering simulations with flexible infrastructure. The new Altair® DSim™ SaaS solution allows semiconductor designers to run unlimited simulations with a pay-as-you-go model, eliminating upfront costs and offering the freedom to scale on demand. The Altair One® cloud innovation gateway enhances collaboration, providing instant access to simulation applications, data, and HPC resources.

Automation and customisation

New automation capabilities, including Python APIs, eliminate repetitive tasks, streamline data queries, and simplify report generation. For large-scale projects, advanced batch execution and task libraries reduce time spent on complex workflows. The platform's customisation options allow users to tailor simulations to unique applications, such as modelling particle interactions in pharmaceuticals or agriculture.

Altair's HyperWorks® 2025 design and simulation platform assists engineers in solving complex engineering challenges.

The rise of chiplets and simplified interconnectivity

In semiconductors, chiplet technology allows for smaller and more compact designs with simplified structures. A new report published by Cambridge, UK based research company IDTechEx, titled *Chiplet Technology 2025-2035: Technology, Opportunities, Applications,* unpacks the benefits and challenges of developing chiplet technology compared with competing semiconductor designs and their best-suited applications.

Chiplet characteristics

Chiplets allow for GPU, CPU, and IO components to be miniaturised to suit the rise of smaller and more compact devices and hardware and offer the possibility of integrating various functions into a more simplified, unified design. The benefits include easy scalability, faster innovation, and cost-effectiveness, alongside enhanced functionality and performance efficiency.

Chiplets can be developed more quickly than monolithic SoCs (System on Chip semiconductors) and multi-chip SiPs (System in Package tecchnologies) and can be largely reused. They are also expected to enable new functionalities that are not as likely to be achieved with monolithic designs alone, particularly in fields such as AI, IoT, and advancing computing systems.

However, although chiplets can generally be adopted in smartphones, automotive systems, high-performance computing (HPC), data centres, and cloud computing, they are not intended to replace monolithic SoCs, which have higher performance efficiencies.

Semiconductor manufacturing processes

Semiconductor nodes becoming progressively smaller in future may help improve chiplet and monolithic designs by increasing component density and function density. At present, monolithic integration is generally used for HPC due to its performance qualities and power efficiency, while chiplets can use less advanced nodes for specialised components with reduced costs and shorter time to market.

Another future trend predicted by IDTechEx is advanced 3D stacking, whereby interconnectivity and thermal management can be improved for both chiplet and monolithic designs, moving away from 2D structures to 3D, and enabling more compact, high-performance systems.

Chiplet technology trends

Achieving universal interconnect standards can enable interoperability for chiplets from different manufacturers and increase their versatility. This will be particularly useful as interest in chiplets grows worldwide in countries such as the US, China, Germany, and Japan. The Chiplet Design Exchange (CDX) is striving to achieve open formats for chiplet designs to facilitate standardisation, which will be necessary to support the wider adoption of chiplets across various sectors.

Partnership to scale up industrial AI

Siemens and Microsoft have taken the Siemens Industrial Copilot to the next level to boost automation engineering.

Siemens and Microsoft last year initiated a partnership to revolutionise automation engineering using Siemens Industrial Copilot. The aim is to improve efficiency, cut downtime and address skilled labour shortages. The initiative sees a global rollout from early 2025.

Through this collaboration, Siemens and Microsoft have taken the Siemens Industrial Copilot to the next level, enabling it to handle the most demanding environments at scale. Combining Siemens' domain know-how across industries with Microsoft Azure OpenAI Service, the Copilot improves handling of rigorous requirements in manufacturing and automation.

Over 100 companies, including Schaeffler and thyssenkrupp Automation Engineering, began using the Siemens Industrial Copilot to streamline processes, address labour shortages, and drive innovation. With 120 000 users already leveraging the Siemens engineering software TIA Portal, they can now enhance their work with the generative AI (gen AI)-powered assistant.

Co-creation partner thyssenkrupp Automation Engineering is the first to use the Copilot globally. Starting from early 2025, its machines will be engineered with the assistant, opening the Copilot potential across its entire product range.

Siemens is pioneering the offering of gen AI for automation engineering in the industry and has made this capability easily accessible, globally, on the Siemens Xcelerator open digital business platform.

"The collaboration between Siemens and Microsoft marks a pivotal moment in the industrial sector; one where AI transformation becomes a cornerstone for innovation and operational efficiency," said Judson Althoff, Executive Vice President and Chief Commercial Officer at Microsoft. "By integrating Microsoft Azure OpenAI Service into Siemens' industrial solutions, we are equipping companies with cloud-based AI tools to simplify complex challenges, drive productivity, and help them stay competitive in an increasingly dynamic environment."

"Together with Microsoft we scale industrial AI, empowering our customers throughout the industry to become more resilient, competitive, and sustainable. thyssenkrupp Automation Engineering shows how customers can use the Siemens Industrial Copilot, in highly demanding environments, to boost efficiency," said Cedrik Neike, Member of the Managing Board of Siemens AG and CEO of Digital Industries.

Since the product was introduced mid-2024, customers across various sectors have started using the Siemens Industrial Copilot for engineering to boost efficiency. Engineers can create panel visualisations in 30 seconds and generate code that requires only 20% adaptation. This streamlines workflows, reducing manual effort and addressing the gaps in skilled labour. The chat function also provides instant, precise answers, eliminating the need for lengthy searches. Leveraging the copilot, companies are driving productivity and innovation.

Transforming battery quality assurance with the Siemens Industrial Copilot, thyssenkrupp Automation Engineering demonstrates the copilot's transformative potential at scale, particularly in complex control, such as development of automated systems for the production of battery and hydrogen assembly lines. One of its machines helps ensure quality of batteries for electric cars, a crucial factor in the sustainable energy transition and the industry's requirement for 100% reliable batteries. Sensors, cameras, and measurement systems are integrated to monitor battery cell quality across multiple stages, conducting complex evaluations to detect discharges beyond set thresholds.

The Siemens Industrial Copilot supercharges the development and operation of this battery machine by automating repetitive tasks like data management, sensor configuration, and the reporting of each step, as necessary to meet strict battery inspection requirements. Generally, the copilot supports engineering by handling routine and essential documentation tasks. This allows the engineers to focus on complex, value-added work. In addition, the copilot's real-time problem-solving capabilities minimise downtime and facilitate smooth production.

"The Siemens Industrial Copilot will potentially ease our workload and address the pressing challenges of labour shortages and increasing complexity in battery testing. This AI-powered solution will be a game-changer for our industry, and we will actively roll it out across our machines," said Dr Volkmar Dinstuhl, Member of the Executive Board of thyssenkrupp AG and CEO of thyssenkrupp Automotive Technology.

For more information visit: www.siemens.com

A new age of electricity

In its* Electricity 2025 *report, the International Energy Agency (IEA) states that strong growth in electricity demand is raising the curtain on a new Age of Electricity, with consumption set to soar to 2027.

Electricity 2025, the latest edition of the IEA's main market analysis of the sector, forecasts that the growth in global demand, at close to 4% annually through the coming years, will be the equivalent of adding an amount greater than Japan's annual electricity consumption each year between now and 2027. The surge is primarily driven by robust growing use of electricity for industrial production, increased demand for air conditioning, accelerating electrification, led by the transport sector, and the rapid expansion of data centres.

The report indicates that most of the additional demand over the next three years will come from emerging and developing economies, accounting for 85% of the demand growth. The trend is most pronounced in China where electricity demand has been growing faster than the overall economy since 2020. China's electricity consumption rose by 7% in 2024 and is expected to grow by an average of around 6% through 2027. The demand growth in China has been fuelled in part by the industrial sector, where alongside the traditional energy-intensive sectors, the rapidly expanding electricity-intensive manufacturing of solar panels, batteries, electric vehicles and associated materials played a significant role. Air conditioning, electric vehicle adoption, data centres and 5G networks are additional contributors.

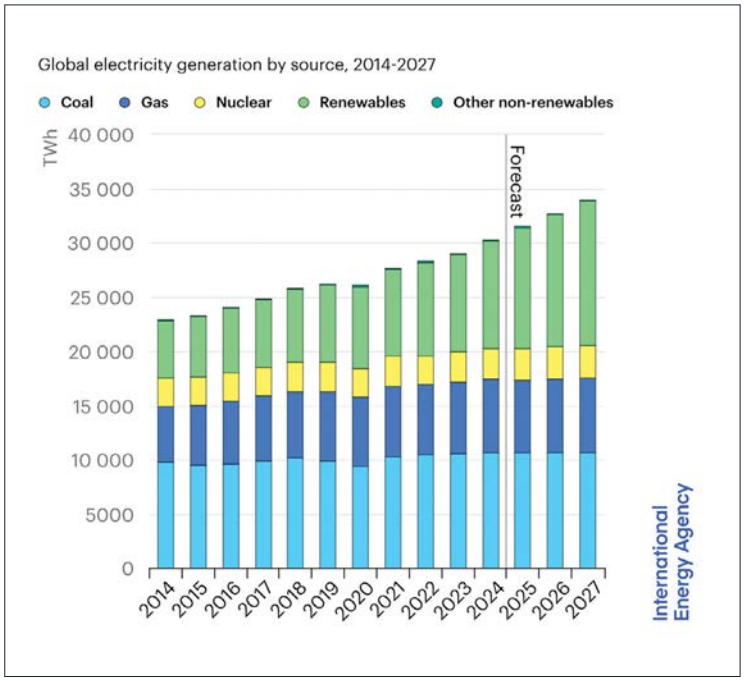
"The acceleration of global electricity demand highlights the significant changes taking place in energy systems around the world and the approach of a new Age of Electricity. It also presents evolving challenges for governments in ensuring secure, affordable and sustainable electricity supply," said IEA Director of Energy Markets and Security, Keisuke Sadamori. "While emerging and developing economies are set to drive most of the growth in global electricity demand in the coming years, consumption is also expected to increase in many advanced economies after a period of relative stagnation. Policy makers need to pay close attention to these shifting dynamics. They will be addressed at the international Summit on the Future of Energy Security that the IEA is hosting with the UK government in London in April."

In the United States, a strong increase in electricity demand is expected to add the equivalent of California's current power consumption to the national total over the next three years. Electricity demand growth is forecast to be more modest in the European Union, only rising back to its 2021 levels by 2027, following the major declines in 2022 and 2023 triggered by the energy crisis.

The new report forecasts that growth in low-emissions sources – primarily renewables and nuclear – is sufficient, in aggregate, to cover all the growth in global electricity demand over the next three years. In particular, generation from solar PV is forecast to meet roughly half of global electricity demand growth through 2027, supported by continued cost reductions and policy support. Electricity generation from solar PV surpassed that from coal in the European Union in 2024, with solar's share of the power mix exceeding 10%. China, the United States and India are all expected to see solar PV's share of annual electricity generation reach 10% between now and 2027. At the same time, nuclear power is making a strong comeback, with its electricity generation on course to hit new highs every year from 2025 onward over the forecast period. As a result of these forecast trends, carbon dioxide emissions from global electricity generation are expected to plateau in the coming years, after increasing by about 1% in 2024.

The report examines some of the major strains faced by electricity systems in 2024, including winter storms in the United States, hurricanes in the Atlantic, blackouts caused by extreme weather in Brazil and Australia, and droughts reducing hydropower in Ecuador, Colombia and Mexico. These events highlight the importance of ensuring greater resilience of electricity systems, the report notes.

It also looks at the critical role of weather for electricity systems and the rising volatility in wholesale electricity prices in some regions, which indicate a growing need for system flexibility. Incidences of negative wholesale electricity prices have been rising in some power markets, although they are still relatively uncommon globally. These occurrences broadly signal insufficient flexibility in the system due to technical, regulatory or contractual reasons.



The IEA's Electricity 2025 *report indicates renewables are set to provide more than one third of total electricity generation globally this year, surpassing coal.*

For more information visit: www.iea.org

Steam: an enduring heat transfer mechanism

The use of steam for industrial purposes dates back to the first industrial revolution and, even in the wake of the fourth industrial revolution and with the proliferation of artificial intelligence, steam boilers remain the unsung heroes of contemporary production. They have been described as the 'chameleons' of manufacturing. Dennis Williams, Commercial Director at steam and boiler operations and maintenance service provider, Associated Energy Services (AES) offers some insights into the use of steam in industries.

The science behind steam use and heat transfer is fundamental to many processes and will remain a requirement for many industries into the future. The mode of steam generation might change, and the fuels might change, but steam will be needed.

Accordingly, the evolution of industrial process steam boilers has seen the upgrading of control systems and instrumentation. The fundamentals of the 'boiler' part of the system, where energy is transferred from combustion flue gases into the water to generate steam, has been well established for many years. The focus has shifted to optimising combustion, improving efficiency, assisting in operability (reaction time, load following capability, turndown) and improving emissions control (reducing CO_2 and NO_x).

If we look at Eskom power-station-sized utility boilers, change has centred on boiler materials and design – with the aim of increasing generation steam pressure to supercritical phase to drive power generation efficiency, and then to consider carbon capture and storage as well as novel combustion systems to drive overall boiler thermal efficiency.

A mix of old and new

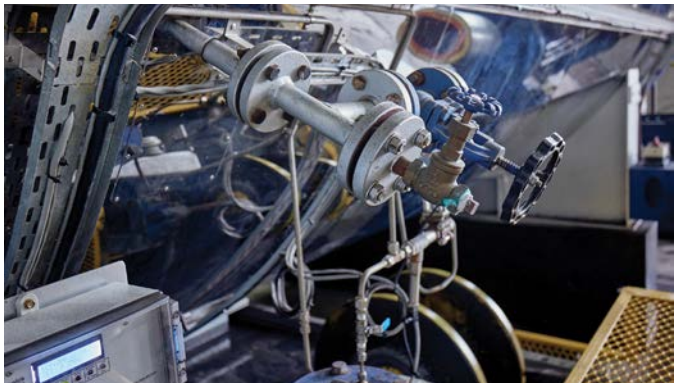
A key question around steam boilers is whether the South African industry has kept up with global technological developments.

Williams says the local boiler fleet is best described as "legacy" plant. This is evidenced by the buoyant second hand / refurbished steam boiler market, arising from the fact that older boilers are extremely robust and, with proper operation and care, can last between 20 and 40 years.

There are, however, ways in which the combustion element (energy input mechanism) can be optimised with retrofits on control systems, fuel switches or technology replacements.

New fuels have also introduced various changes, with more gas-fired, biomass and other fuel systems being implemented, to facilitate the use of (previously) inefficiently used resources and drive circular operating systems.

Steam cooker in a food factory.



Package steam boiler with stainless steel cladding.

However, the main differentiator between South African boilers and those used in North America and Europe, for example, is the use of coal, which elsewhere has been replaced by alternative fuel sources, mainly gas.

On larger-scale plants, there has been a lot of activity in fluidised bed systems, including bubbling and recirculating fluidised bed boilers. Their lower combustion temperature has a positive effect on NO_x generation and the technology is suited to solid fuels. Fluidised bed boilers have also been used in a few limited applications in South Africa, but the substantial capital investment cost has detracted from this option.

One of the main reasons that steam is enduringly popular is because it is an extremely useful and highly efficient heat transfer mechanism. It contains both latent and sensible heat energy and can deliver substantial quantities of energy in smaller flows than alternative heat transfer mechanisms relying solely on sensible energy (temperature). Steam can ensure that temperature within a system is accurately and effectively controlled.

Multiple steam applications

The use of steam is widespread across diverse industry sectors. These range from the food industry (cooking, heating, cleaning, sterilising), rubber (curing, setting, heating), pulp and paper (raw materials preparation, drying, setting), and textiles industries (dye house water heating, textile setting with heat exchangers), to healthcare (sterilisation, air conditioning, laundry services, cooking), mining process (heating, activated carbon regeneration), medical manufacturing (sterilisation, air conditioning and temperature control), power generation (steam turbine driving), desalination (waste heat use for evaporative water process), wood board manufacturing (fibre processing, platen heating for board curing) and chemical manufacturing (various processes for heat supply, as well as direct use through injection into raw materials).

In South Africa, efforts to improve and grow local industries such as the food and textile sectors could certainly see an increased demand for steam.

The right boiler for the job

There are two main types of boilers. Those with a fire tube design, which is essentially a cylindrical vessel containing water with tubes passing through it, carry hot flue gas through the inside of the tubes. Heat transfers through the tubes to the body of water on the outside of the tubes, in turn creating steam. Water tube boilers, which contain less water volume per unit steam output, feature upper and lower steam drums connected by boiler tubes. Water boils within the tubes, with steam rising to the top of the boiler into the steam drum.
There is also the option of a combined water tube and fire tube design.

Optimising efficiencies and understanding a customer's current and future operational requirements are critical when selecting a boiler. Williams emphasises that the decision needs to be robust and defensible in terms of longer-term business strategy. The assets are expensive to buy, operate and maintain and have potentially long service lives if well maintained, so a selection error can impact on many fronts for a long time.

AES works with customers to assist them in making such decisions. With many years of experience across various industries, operations and energy plants, the company is well equipped to provide the necessary insights regarding capex, opex, and other factors. After engaging with a client to understand their overall objectives, AES can provide an overview of potentially workable steam boiler alternatives and assist in clarifying the technicalities of each. It also works with customers to assist with the execution of a project on a turnkey basis, or a combined turnkey project development, operations and maintenance basis, with agreed service levels which cover a longer-term contract period (at least three years). AES then provides a steam solution and is fully accountable to the client around the operational outcomes.

For more information visit: www.aes-africa.com

Energy management + energy efficiency: Products + services

Championing energy-efficient motors

South Africa's adoption of Minimum Energy Performance Standards (MEPS) mandates that all newly imported electric motors must meet IE3 premium efficiency levels. SEW-EURODRIVE is ahead of the game in this regard – the company standardised on IE3 motors more than eight years ago and it enabled its customers to transition to the advanced technology without bearing additional costs.

Willem Strydom, Business Development Electronics Manager at SEW-EURODRIVE South Africa.

Willem Strydom, Business Development Electronics Manager at SEW-EURODRIVE South Africa, highlights that several industry sectors have been proactive in moving towards energy efficiency. Rising electricity prices are driving industries to adopt IE3 motors, which are estimated to consume 7% to 8% less energy compared to IE1 models, according to SEW-EURODRIVE. Strydom says that when paired with variable speed drives (VSDs), energy savings can reach up to 15%.

He highlights that: "Energy efficiency reduces operational costs and supports companies in terms of their decarbonisation goals. As most electricity in South Africa still comes from coal, reducing consumption directly lowers the carbon footprint."

SEW-EURODRIVE assists its customers by conducting on-site energy assessments and product population surveys at no cost. "In these evaluations, inefficiencies are identified, helping companies to plan their transition to IE3 motors strategically and cost-effectively," Strydom says. "The data collected also provides early warnings about potential equipment failures, reducing downtime risks."

To ease the shift further, SEW-EURODRIVE advises customers to prioritise upgrades in motor classes with lower stock levels and balance replacements between larger and smaller motors for maximum impact. VSDs are often recommended to manage peak energy demands, reducing cost penalties and extending motors' lifespans.

Looking ahead, Strydom believes MEPS will accelerate the adoption of even higher efficiency IE4 and IE5 motors. SEW-EURODRIVE is already leading this innovation with its IE5 synchronous motors, which feature integrated permanent magnet technology and deliver up to 50% lower energy losses compared to IE3 models.

"SEW-EURODRIVE's commitment to advancing energy efficiency is backed by our 300-strong global research and development team," he says. "We are already pioneering IE6 technology, setting new benchmarks in sustainability and performance."

With its forward-thinking approach and strong customer support, SEW-EURODRIVE continues to drive advances in energy efficiency in South Africa, helping industries meet their sustainability and cost-saving goals.

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

SEW IE3 electric motors offer energy savings in the beverage industry – and in many other industry sectors.

Low voltage stabilisation system – a pilot project

A. Eberle Africa (Pty) Ltd, based in Durban, South Africa, and A. Eberle GmbH & Co. KG, based in Nuremberg, Germany, recently showcased the first Low Voltage Regulation System (LVRSys®) installed in South Africa at the head office of Siemens Sub-Saharan Africa in Midrand. The success of this pilot project, already operational for about nine months, demonstrates the system's capabilities and opens the way to its wider use in improving power stability and efficiency within critical infrastructure – and, over the longer term, strengthening South Africa's electrical grid.

Developed in Germany and tailored for the South African market, the LVRSys® system is designed to mitigate power disruptions, support energy-intensive industries, and contribute to sustainable energy practices.

Electricity + Control attended the unveiling of the pilot installation at the head office of Siemens Sub-Saharan Africa, where the LVRSys® serves to safeguard the stability of electricity supply specifically for the Siemens data centre.

The project is supported by the Federal Ministry of Economic Affairs and Climate Action of Germany, as part of the Renewable Energy Solutions Programme of the German Energy Solutions Initiative and on the basis of a decision by the German Bundestag. It was implemented by dena, the German Energy Agency, working in collaboration with A. Eberle Africa and A. Eberle, Germany. The unveiling brought together representatives from all these stakeholders: the German Ambassador in South Africa, Andreas Peschke, alongside hosts Sabine Dall'Omo, CEO of Siemens Sub-Saharan Africa, and Marco Rahner, Sales Director of Siemens Smart Infrastructure, Claudia Ardelean of the German Energy Agency, and A. Eberle Africa's Managing Directors, Till Sybel and Brian Howarth. This is a reflection of the well-recognised potential of this cutting-edge technology for widespread application across South Africa, to fortify grid resilience and energy efficiency.

At present, the whole system is manufactured in Germany, but the aim is to establish a local assembly facility here, then import only the electronics from Germany.

A smaller scale model of the LVRSys® Low Voltage Regulation System was on display at the event. Guests also had the opportunity to visit the pilot installation in-situ.

The South African context

The demands on electricity distribution networks are changing worldwide. With the wider use of photovoltaic and other renewable energy sources, voltage fluctuations increase, and the growing use of electricity across different sectors of the economy changes once familiar demand patterns to new cycles of usage.

Although in South Africa the focus to date has been mainly on securing baseload capacity and ensuring electricity availability, the continuing expansion of renewable energy sources feeding into the grid – as well as concerns around inadequate maintenance and development, plus high levels of vandalism and theft – are raising a growing need to attend to grid stability.

This is where technological solutions for efficient voltage stabilisation across grids at all levels can deliver significant benefits.

The pilot installation

The Siemens data centre in Midrand was previously reliant on an outdated system that no longer met its requirements. It was based on servo motor regulation with mechanical step adjustment, which presented significant limitations – including a long response time of several minutes and a frequent need for maintenance, which meant the server was down for extended periods of time.

For Siemens, the decision to replace the existing system with LVRSys® was easy. It offers reliable and robust technology that enables high-precision voltage regulation with a response time of less than 30 milliseconds, effectively compensating for voltage fluctuations which had previously been problematic. The LVRSys® Low Voltage Regulation System ensures continuous and reliable operation of Siemens' critical data centre infrastructure.

The dismantling and environmentally compliant disposal of the old system was carried out by a local partner company, Instelec Services, in collaboration with A. Eberle Africa.

The LVRSys® operates across the range of 7.5 kVA to 630 kVA. It claims a lifespan of 20 billion switches over 10 years, with short circuit protection up to 50 kA.

A key advantage of the LVRSys® is its exceptionally high efficiency, ranging from 99.4% to 99.8% across all available performance classes. This makes it one of the most energy-efficient and environmentally friendly solutions on the market.

A. Eberle Africa's Managing Directors, Till Sybel and Brian Howarth, outlined how the technology operates. Sybel added that, at present, the whole system is manufactured in Germany and units would be shipped to South Africa, but he said the aim is to establish a local assembly facility here and then import only the electronics from Germany. As well as supporting local manufacturing capabilities, this would help to reduce costs for local installations.

Howarth made the point that, for applications in manufacturing plants or on mine sites, for instance, the LVRSys® would ideally be selectively installed closest to the point of critical supply – to ensure stability in the power supply where it is needed most.

Importantly, the LVRSys® Low Voltage Regulation System provides an efficient alternative to conventional grid expansion by mitigating or potentially avoiding the need for new transmission infrastructure. Its economic benefits make it a viable solution for almost all low voltage networks. Investments in new power lines tie up capital for decades, whereas the LVRSys® system requires relatively low investment, it is flexible and independent of location. If grid conditions improve significantly in one area, the LVRSys®, as a fully enclosed cabinet installation, can be relocated and adapted to new requirements.

A. Eberle Africa (Pty) Ltd is the African subsidiary of A. Eberle GmbH & Co. KG, specialising in power quality, transformer monitoring, and voltage regulation solutions tailored for the African market. The company is dedicated to enhancing grid stability, optimising energy efficiency, and supporting sustainable infrastructure development across the continent. Through strategic partnerships and local expertise, A. Eberle Africa aims to address the unique challenges of power distribution in the region.

Acknowledgements to the project partners for the information provided: Mittelstand Global – Energy solutions made in Germany; the Federal Ministry for Economic Affairs and Climate Action; dena – the German Energy Agency; A. Eberle Africa, and Siemens Sub-Saharan Africa.

For more information visit: https://www.a-eberle.co.za/

Energy management + energy efficiency: Products + services

Minimising reactive power and harmonics in one

Power quality expert CP Automation has added the REVCON RPC-eSVG to its range of power factor correction (PFC) equipment to help protect industrial facilities from high reactive power usage and shield LV (low voltage) applications. As well as being a reliable alternative to capacitor banks, which are vulnerable to resonances, the new device is more compact than competitive static var generators (SVGs) and can filter a limited range of harmonics.

CP Automation has added the REVCON RPC-eSVG to its power factor correction range.

Whereas traditional capacitor banks use contactors, the RPC-eSVG uses silicon carbide (SiC) MOSFETs to control the reactive power. By avoiding additional components like snubber circuits and supporting smaller inductors, transformers and capacitors, the new device can improve power density significantly, offering a more compact and lightweight design.

In addition to providing protection against high reactive power usage, the RPC-eSVG can compensate harmonics in the 5th to 13th order (250-650 Hz). This is where most industrial loads, such as motors and drives, typically sit on the frequency spectrum. Thus, it provides holistic protection for a wide range of devices.

John Mitchell, Global Sales and Marketing Director at CP Automation says, "High reactive power usage and harmonics are common issues in industrial facilities, and treating the two in tandem is a game-changer. Many engineers and operators will have used either capacitor banks or conventional SVGs, but these will only compensate reactive power. Protecting against harmonics requires an additional solution, with added costs and footprint.

"By using SiC technology, the RPC-eSVG offers unparalleled efficiency," Mitchell adds. "The SiC version of the SVG offers superior technology, efficiency and footprint compared to other solutions, such as IGBT-based SVGs, thyristor-controlled capacitor banks, and tuned and detuned capacitor banks."

Another benefit of the RPC-eSVG is its response time. Typically, a capacitor bank will take around 40 seconds to activate or deactivate and adjust the power factor. In contrast, the new product from REVCON has a response time of less than 15 milliseconds, which means it can adapt much more quickly to changes in power system conditions, like voltage fluctuations or sudden load shifts. This allows for efficient, timely correction of reactive power.

Enabling businesses to prosper as prosumers

As more businesses adopt renewable energy solutions like rooftop solar and energy storage, they can become prosumers – functioning as consumers and producers of energy. This presents organisations with a significant opportunity to provide distributed energy resources (DERs) and participate in the bi-directional flow of energy.

Nishan Baijnath, Systems Architect, Power Systems at Schneider Electric explains the possibilities. "We have seen the rise in small-scale embedded generation (SSEG) in South Africa, particularly in the commercial and industrial sectors, with many businesses investing in rooftop PV applications.

"With continuing uncertainties over electricity supply from the grid, businesses have sought ways to supplement their energy needs by using renewable sources."

He says many of these commercial and industrial installations are now generating more energy than they can consume, resulting in excess energy capacity. "This means customers that were traditionally only consumers, purchasing energy from the national or municipal utility, can now produce more than enough energy for themselves, enabling them to become 'prosumers' – consumers and producers of energy.

Bi-directional energy flow

"Prosumers can choose when they consume energy, or produce and export energy to the grid, depending on the time of day. As a result, the energy flow becomes bi-directional, in place of the traditional one-way flow from the utility or municipality to the consumer," Baijnath notes

However, this shift necessitates a robust framework to manage such distributed resources effectively. This is where Distributed Energy Resource Management Systems (DERMS) come into play.

Schneider Electric's EcoStruxure DERMS is an enterprise system that is typically deployed by power utilities. It enables them to manage DERs on their grid. EcoStruxure DERMS allows utilities to have better control and visibility over the various DERs, such as rooftop solar, batteries and other small-scale generation sources, that are being connected to the grid.

Baijnath says EcoStruxure DERMS is an industry-leading, grid-aware solution customised for utility needs. At its core, it offers essential DER monitoring, forecasting, and control. This empowers important functions like hosting capacity analysis, grid constraint management, and leveraging DER flexibility. With options for on-premises or cloud deployment, it is the key to active network management.

"The EcoStruxure DERM system enables the utility to orchestrate and coordinate the operation of the distributed energy resources feeding into the grid. And DERs are becoming more widespread as prosumers emerge," Baijnath says.

"The system communicates directly with the individual small-scale generation assets, such as inverters and batteries. Through this communication, DERMS can exert a certain level of control over the operation of the distributed energy resources."

Nishan Baijnath, Systems Architect, Power Systems at Schneider Electric.

Flexibile integration

He adds that the EcoStruxure DERMS platform's flexibility to integrate with a utility's existing enterprise systems is a key feature of the solution, as it allows the DERMS to access and use critical data from across the organisation to support its DER management capabilities. It can be deployed as a standalone cloud based (hosted) solution, standalone on premises, or embedded in EcoStruxure ADMS on premises.

Furthermore, the open and flexible integration capabilities of the platform present a valuable differentiating factor, enabling utilities to leverage the DERMS while maintaining connectivity to their existing enterprise systems and distributed energy resources. The platform can communicate with renewable generation sources, traditional generation sources, batteries, microgrids, aggregators and demand response management systems.

Additionally, businesses can participate in demand response programmes facilitated by DERMS, they can reduce their energy costs and contribute to grid stability during peak periods. Enhanced situational awareness allows companies to understand their energy impact and make informed decisions about energy management.

"The demand response capabilities enabled by the EcoStruxure DERMS platform give businesses the flexibility to optimise their energy strategies, financially and operationally, by managing their consumption, storage, and export of energy," says Baijnath.

Schneider Electric's DERMS platform is thus enabling businesses and communities to become more self-sufficient and sustainable in their energy management, and in parallel they contribute to the overall resilience of the grid through coordinated energy trading and optimisation.

The EcoStruxure Distributed Energy Resource Management System is an enterprise system designed to enable power utilities to manage DERs on their grid.

Ensuring efficient cooling for data centres

Jarryd Tate, FUCHS Lubricants South Africa

The global data centre industry is experiencing unprecedented growth, fuelled by the fast-growing demand for data and advanced computing power. Some reports predict that the industry, growing at a compound annual rate of +10%, wiil be worth about USD 517 billion by 2030[1]. This expansion is driven by transformative technologies like 5G communications and artificial intelligence (AI), which demand higher performance from processors and servers.

The demand for high performance computing raises the challenge of effective cooling. Traditional air-cooling systems, reliant on space, energy, and water, are no longer sustainable for hyperscale and co-location data centres.

Jarryd Tate, Technical Application Engineer at FUCHS Lubricants South Africa, says, "Immersion cooling has emerged as a groundbreaking solution for managing the escalating cooling demands of today's powerful processors and servers."

FUCHS Lubricants is at the forefront of this transition.

Liquid cooling, long the 'go-to' solution for high-performance computing centres, is now becoming a mainstream solution for data centres. Among its forms, immersion cooling stands out as the most capable for handling future challenges. This technology submerges hardware components in specially engineered fluids, delivering unmatched efficiency.

Single-phase immersion coolants are attractive due to their zero ozone depletion or global warming potential, alongside simpler designs that reduce operational complexity. Immersion cooling systems lower energy consumption significantly, reduce water usage, and require less maintenance, leading to a decrease in overall operating costs. Immersion cooling systems also contribute to improved uptime, processor performance, server density, and overall power usage effectiveness.

Beyond efficiency gains, immersion cooling offers considerable environmental benefits. In facilities where it is used: it lowers the carbon footprint and energy usage as well as enabling waste heat capture and reuse. The design advantages are equally strong, allowing for data centres to eliminate costly chillers, air handlers, and rack fans, and minimise concerns about regional climate, dust, and air pollution.

"Immersion cooling addresses the operational challenges of traditional systems and aligns with global sustainability goals," says Tate. "This makes it a good option for future-ready data centres."

Despite its advantages, some operators hesitate to adopt immersion cooling due to concerns around handling large volumes of fluids and potential disposal requirements. FUCHS addresses these challenges with its modular services for immersion coolant management. Leveraging decades of experience in chemical process management, it provides tailored solutions covering the full life cycle of immersion coolants, from initial implementation to ongoing maintenance. This ensures that the benefits of immersion cooling are sustained over time.

FUCHS has been a trusted supplier of solutions for information technology and telecommunications for decades. Its advanced RENOLIN FECC (Fluids for Electronic Component Cooling) product line, formulated with synthetic base oils and powerful additives, is specifically designed to meet the needs of today's data centres. RENOLIN FECC products deliver superior cooling performance, reliable dielectric properties, and high breakdown voltage, with zero global warming or ozone depletion potential. The range offers an extended lifespan due to its thermal and oxidation stability, and it is compatible with common electronic components.

Beyond the RENOLIN FECC line, FUCHS also provides a wide range of products designed specifically for data centres, including single-phase immersion coolants, direct-liquid-cooling fluids, electronics and systems cleaners, electrical connector greases, and refraction index matching optical gels.

As the data centre industry continues to grow, the demand for innovative cooling solutions is high. "With its industry expertise and its commitment to sustainability and innovation, FUCHS is well-equipped to be a global leader in this niche lubricants sector," says Tate.

Reference

[1]. Allied Market Research: https://www.alliedmarketresearch.com/data-center-market-A13117

FUCHS Lubricants is providing innovative cooling solutions to meet the escalating demands for efficient cooling in HPC data centres.

Mitigating rising electricity costs

The National Energy Regulator of South Africa (NERSA) approved a 12.7% electricity tariff increase for the 2025/26 financial year, effective from April 1, 2025. Although this increase is lower than Eskom's requested 36%, it is significantly higher than the current level of inflation and adds further financial strain on businesses.

Electricity tariffs in South Africa have been rising consistently, year on year, with some reports indicating annual hikes of more than 15%. These escalating costs are prompting businesses to rethink their energy strategies.

For manufacturers, retailers and other energy-intensive businesses in the commercial and industrial sector, electricity is critical to maintaining competitiveness. Every tariff increase raises operating costs, restricts margins, and makes long-term planning more challenging.

Richard Flamand, Country Lead of Candi Solar South Africa notes, "Previously, load shedding was the primary driver for investment in solar PV and battery storage, as businesses sought alternatives to keep operations running. Today, the conversation has shifted. Investing in solar and battery storage is about taking control of energy costs, locking in long-term savings and building financial resilience in an unpredictable market."

With electricity prices on an upward trajectory, businesses are looking for ways to hedge against financial risk. "Solar energy is now a strategic investment," says Flamand. "Research indicates that South Africa's installed capacity is projected to grow by over 11% annually, from 6.05 gigawatts in 2024 to 10.27 gigawatts by 2029. This rapid growth highlights the increasing role of solar energy in mitigating electricity expenses and providing a stable energy source for businesses," he says.

At the same time, advances in battery storage technology are making solar solutions more efficient and valuable. The South African battery storage market is expected to grow from 270 MWh in 2020 to 9 700 MWh by 2030. As technology improves, battery storage is becoming more affordable and scalable, allowing businesses to store excess solar energy for peak demand periods and further stabilise their electricity costs.

Looking ahead, tariff increases will remain a pressing issue, reinforcing the need for proactive energy planning. Flamand suggests that businesses that diversify their energy sources now and invest in cost-saving renewable solutions will be better positioned to navigate the evolving energy landscape and protect themselves from ongoing price volatility.

High performance dc-dc converter

The PowerGood dc-dc converter – its Supreme series Full Brick converter available in a range up to 960 W – offers high performance, fixed switching frequency and predictable EMI (electro-magnetic interference). Load share is enabled by the single wire connection. Further standard features include output current limit and short circuit protection, output overvoltage protection, output voltage trim range of -10%/+10% and input under-voltage lockout. Each module is supplied completely encased to provide protection from the harsh environments in many industrial and transportation applications.

Other key features include:

- Vicor pin out
- Wide range of operating temperature
- Ceramic capacitor design
- Optional parallel output
- UVLO / OCP / OVP / OTP (that is, undervoltage lockout/ overcurrent protection/ overvoltage protection /one-time programmable memory).

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

The PowerGood SFB Series of dc-dc converters is available in South Africa through Vepac Electronics.

Leading technology for industrial weighing and inspection

The CoSynus® checkweigher combines the functions of a checkweigher and a metal detector in a single compact device.

Minebea Intec, a leading manufacturer of industrial weighing and inspection technologies, recently exhibited at ProPak Africa 2025, held at the Johannesburg Expo Centre from 11 to 14 March, in collaboration with its South African partner Precision Control Pty Ltd.

ProPak is one of Africa's leading exhibitions for the packaging, processing, printing, and plastics industries. At the show, Minebea Intec shared a comprehensive selection of products from its portfolio, featuring solutions for check-weighing, foreign body detection, static and process weighing, as well as truck weighing. It also presented live demonstration units showcasing the functionality and performance of its high-precision technologies.

The packaging industry in Africa is on the rise, driven by population growth, the expansion of the retail sector and the demand for sustainable packaging solutions. At the same time, companies face the challenges of meeting international quality standards, optimising production processes and implementing food safety technologies. Minebea Intec offers a portfolio of weighing and inspection technologies that meet the requirements of local manufacturers and international corporations. At ProPak Africa, it presented some of the advanced technologies it has developed specifically for the packaging industry.

High-precision metal detection

For the detection and rejection of metal contaminated products, Minebea Intec offers high-precision metal detectors. Manufacturers that choose to make use of metal detection benefit in several ways. Primarily, they gain the assurance of product quality and consumer protection. Contaminated products can lead to expensive recalls and brand damage. Additionally, the efficient operation of metal detection systems ensures minimal downtime and smooth production processes, enhancing overall productivity and cost-effectiveness. Minebea Intec offers two metal detection systems for the industry, Vistus® and Mitus®. The premium solution Mitus® has a higher detection sensitivity than Vistus®, but both solutions can be integrated one-to-one with Minebea Intec's conveyor, free-fall or pipeline systems.

Compact precision and innovation

Checkweighers are used in the packaging industry to ensure products meet the specified weight and thus comply with legal and operational standards. The CoSynus® checkweigher combines the functions of a checkweigher and a metal detector in a single compact device. This solution ensures precise weight control and simultaneous metal detection, increasing the efficiency of production lines. It is particularly suitable for manufacturers that have limited space but do not want to compromise on quality.

A key feature of the CoSynus® is the new Blue HMI (human machine interface), an innovative development for checkweighers. Designed for intuitive touchscreen operation, it is easy to use, enhancing convenience and efficiency. With clearly structured menus, users can adjust weight checks, analyse production data, and generate reports in a few steps – directly on the device. This provides for smooth integration into production lines, minimises set-up times, and boosts efficiency in the packaging industry.

Advanced X-ray inspection

X-ray inspection systems detect products contaminated with metal, glass, rubber, stones, plastic parts or bone fragments. They can also perform in-line quality checks such as weight determination, component counting, detection of missing or defective products, fill level checks and closure integrity checks. Minebea Intec offers a range of X-ray systems for the inspection of packaged products. They are typically used to monitor cartons, boxes, bags, trays and portion packs containing dry or liquid food products.

The compact, powerful X-ray inspection system Dylight, which was also on show at ProPak, offers an efficient solution for detecting foreign bodies in packaging. Its compact design makes it ideal for smaller production environments, while maintaining the high quality and reliability of Minebea Intec products.

The Dymond S X-ray inspection system provides maximum safety through multi-sided radioscopy, ensuring reliable foreign object detection in high, upright-standing packaging. With its

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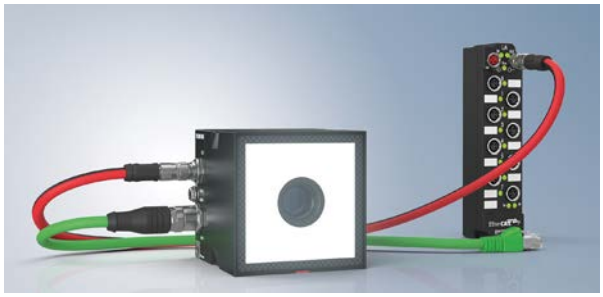
The Dylight X-ray inspection system and the Mitus® metal detector were among products on show at ProPak Africa 2025.

Expanded range for compact vision system

Beckhoff has introduced four new vision units to its VUI2000 series. The Vision Unit Illuminated (VUI) is a compact unit comprising the camera, illumination, and focusable optics complete with liquid lens technology. It reduces installation and commissioning effort significantly.

All functional components of the VUI are encapsulated in an attractive anodised aluminium housing in protection class IP65/67. In addition to the existing models in the portfolio, the four new devices feature colour or monochrome image sensors with resolutions of 2.3 MP or 3.1 MP in a 16 mm focal length.

The liquid lens used in all VUIs does not require any mechanically moving parts. The unit is calibrated at the factory so that focus adjustment can be carried out with a high degree of accuracy using real dimensions. The optimum choice and combination of lens position, aperture, and resulting depth of field ensures the focus can be adjusted reliably in the distance range from 10 to 2 000 mm, which goes beyond the optimum distance range for the illumination. Temperature-related changes in refractive power are compensated for by means of continuous temperature measurement and a corresponding mathematical model.



Due to the focus adjustment during runtime, the VUI is particularly suitable for variable product heights, as in logistics applications, for example.

For more information visit: www.beckhoff.com

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hygienic design, high-speed image processing, and seamless integration into automated production lines, it provides efficient and precise quality control in industrial applications.

In addition to checkweighers, metal detectors, and X-ray inspection systems, Minebea Intec also provides high-precision scales for static weighing and load cells for vessels, silo, or truck weighing. Its portfolio of solutions includes counting, fill level control, batching, and dosing systems as well as foreign body detection and weighing. Its fully automated systems ensure efficiency and safety, and the company provides full support throughout project planning processes.

Willy-Sebastian Metzger, Director Business Development & MarCom at Minebea Intec says, "We are committed to providing optimal equipment for precise weighing and inspection, and this is complemented by the top-tier local sales, support and service team from our partner Precision Control. Together, we ensure our customers receive the right products and the expertise and service they need to optimise their production processes."

Rotary atomisers for efficient paint spraying

Painting the bodywork is an integral aspect of vehicle manufacturing. During the early period of car manufacturing, high-gloss bodywork finishes were associated with high costs and time expenditure. The first electrostatic rotary atomisers were developed in the 1980s and '90s.

In its standard product portfolio KELLER offers pressure sensors to meet most needs; it also optimises products for specific applications.

Rotary atomisers (also known as paint robots) offer the advantage of using material economically. Due to the high-voltage paint charge, 90% of the paint is applied directly onto the bodywork, so waste is minimised.

Rotary atomisers of this kind simply require a rotating disc The paint to be atomised forms a film on the disc that becomes increasingly thinner towards the edges and dissolves into droplets – and their size is controlled by the speed of rotation. A nozzle ring is needed around the atomiser to direct and shape the paint jet. The atomiser can then be operated in any position and used for external and internal finishing. This type of rotary atomiser is, therefore, ideal for the car industry.

Intrinsically safe pressure transmitters

KELLER supplied intrinsically safe pressure transmitters and intrinsically safe temperature sensors to a client that produces paint robots for the car industry.

How are they intrinsically safe? Although non-flammable water-based paint is usually used on bodywork parts, the mist created during atomisation can become flammable, and although hazards occur only rarely during paint spraying, rotary atomisers must be equipped with explosion-proof technology.

Pressure transmitters fitted in the robot's spray head measure the spray pressure in the paint spray system and detect quick pressure changes which may be caused, for example, by placing hoses. The pressure transmitters are located in a high-voltage field and communicate with the robot control mechanism via a fibre-optic cable. In contrast, additional pressure transmitters and temperature sensors monitor the dosing system and the pumps of the axes. These pressure transmitters communicate with the control system through conventional analogue connectivity via copper conductors.

KELLER's equipment manufacturing team develops automation solutions that are tailor-made for the requirements of its production department and meet its high standards of quality and precision. This has enabled KELLER to improve its products and process stability and efficiency continually over the past 50 years.

Keller is represented locally by Instrotech, which supplies the rotary atomisers for efficient paint spraying to the South African market.

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

The advantage of using robots for spray painting is that they handle the material economically.

Pressure measurement in the semiconductor industry

With the new GEMÜ C33 HydraLine pressure gauge, the valves, measurement and control specialist from Ingelfingen, GEMÜ, introduces an innovative solution for the demanding requirements of semiconductor production. As the successor of the tried and tested GEMÜ C32 Hydra-Dry, the new pressure gauge offers an optimised combination of precision, reliability and flexibility. With a ceramic sensor and an innovative sealing concept, the GEMÜ C33 HydraLine sets new standards in process monitoring.

With this new pressure gauge, GEMÜ offers a solution for the reliable monitoring of filters, precise back pressure control and the precise measurement of liquid levels. The GEMÜ C33 HydraLine enables high-precision pressure monitoring in numerous process applications.

Key to its effective performance is the new sealing concept. With the use of a ceramic sensor, the separation of media takes place without transmission fluid as a transfer medium; this is designated as a 'dry system'. This avoids contamination of the process medium in the event of a leakage.

The ceramic sensor also has the advantage of a high resistance to chemicals and ensures precise measurement results under extreme conditions.

A key feature of the new sealing concept is that the sensor and electronic system are completely enveloped by a PTFE sensor sheath. This design functions without media wetted O-rings and substantially reduces the number of separation points. Additionally, the thickness of the diaphragm significantly delays diffusion.

With its compact design, the new GEMÜ C33 HydraLine pressure gauge can be integrated easily into existing systems and plants. The modular design enables space-saving use on valve blocks and facilitates future system expansions. In addition, compatibility with the predecessor GEMÜ C32 Hydra-Dry has been considered, which makes the changeover easier for existing customers.

Two installation versions are available. The in-line version allows the sensor to be integrated into the piping, without the risk of air cushions that could lead to errors of measurement. With the dead-end version, the sensor can be replaced while the process is running – ideal for plants that are in continuous operation.

The GEMÜ C33 HydraLine offers a compact, easy to install solution for process monitoring in semiconductor production.

A standalone lightning warning system

South Africa is well known for its dramatic lightning and thunderstorms. These can be disruptive and dangerous, especially for outdoor facilities such as sports facilities like golf courses and sports fields, and beyond these, for remote utility installations such as water treatment plants, power transmission substations, and mining sites. Severe thunderstorms and lightning strikes raise risks for personnel as well as equipment and protection measures are essential.

Biral (UK), now part of the Senseca Group, specialises in environmental and meteorological measurement instrumentation. It has recently launched its BTD-200 lightning warning system, which is a complete detection and warning system.

Senseca South Africa Managing Director, Jan Grobler says the BTD-200 delivers where many other systems fail due to its professional aviation grade lightning technology. "The proven BTD-200 system is compact, easy to install and does not rely on secondary measurements in order to activate the warning system. Its highly specialised technology delivers the warning as soon as lightning is detected."

The BTD-200 offers detection technology that reliably detects the presence of all forms of lightning in a range of up to 35 km from the sensor. The sensor, which is quick and easy to install, is supplied complete with a universal mains voltage power supply and the essential PC server application 'Lightning Works' for monitoring, warning and data logging of approaching thunderstorms.

"For lightning detection requirements of over 35 kilometres, Biral also supplies the BTD-300 Series, which can reliably detect and range cloud-to-cloud lightning over a range of 83 kilometres, exceeding the US FAA requirements. The BTD-300 works on an electrostatic operating principle which enables the sensor to warn of the risk of overhead lightning before the first discharge occurs. Cloud-to-cloud strikes are typically much more common than cloud-to-ground strikes," Grobler says.

When lightning discharge occurs, there is a significant transfer of electric charge which causes a disturbance in the atmospheric electric field that is detectable to a distance of more than 100 km. This low frequency disturbance is detected by the BTD-200 antenna and the signal is processed to detect and range the lightning discharge. Importantly, the BTD-200 can issue a warning of potential overhead lightning before the first strike. This is not possible using radio-based detection systems.

Key benefits of the BTD-200

- Fully automatic alarm triggering
- Warning of the most dangerous (overhead) lightning risk before the first lightning strike
- Advanced, automatic self-testing to ensure system operation
- An accurate 35 km detection range
- Performance in accordance with IEC 62793 for a Class A detector
- Compliance with EN 50536:2011+/A1:2012 for a Class 1 detector
- Detection of cloud-to-ground, intra-cloud and cloud-to-cloud lightning
- Detection of charged precipitation and strong atmospheric electric fields
- The detector is supplied with Lightning Works server software.

"The BTD-200 can significantly improve safety on industrial sites and it supports professional meteorological applications. The system filters out the higher frequency electromagnetic radio waves, which are often the cause of sensor confusion and false alarms on standard systems. The BTD-200 instrumentation has practically a zero false alarm rate." says Grobler.

The BTD 200 lightning warning system supports safety in outdoor facilities and on remote industrial sites.

Remote monitoring for safe nuclear sites

Monitoring temperature is a critical factor in maintaining safe nuclear operations. Here, Gary Bradshaw, Director at remote monitoring specialist Omniflex, highlights the important role remote monitoring technology plays in the nuclear sector.

Omniflex designs and manufactures electronic products and systems for the automation and control industry worldwide, specialising in remote monitoring.

If the temperature of a reactor or fuel rod rises to a potentially dangerous level, it runs the risk of causing a fire and other catastrophic events. Unexpected high temperatures can cause environmental and health risks as well as unplanned downtime, preventing essential work being conducted. Being alerted to a potentially dangerous situation arising before it takes hold is key for safety and business.

A nuclear facility has several applications where temperature monitoring is important. These includes aspects that stem from the reactors and spent fuel rods, dry stores, and the reactor core.

It is always important that any temperature measurement is accurate. Even minor inaccuracies can lead to significant risks, including overheating or mismanagement of a cooling system. Reliability is essential so that no anomalies go undetected, especially when potentially hazardous equipment is involved.

The centre of spent fuel rods, for example, can be as hot as 1 000°C when they are removed. They are radioactive and take several years to cool. Although they typically go through a vitrification process to encapsulate them in glass after removal and are then stored in concrete, spent fuel rods still need to be monitored for many years because of their hazardous nature, and because their temperature can still increase to dangerous levels.

This, along with the radiation exposure, highlights the harsh conditions that any technology used in monitoring nuclear sites must be able to withstand. Some nuclear facilities have a lifespan of over 150 years before radioactive material can be removed, so whatever may have been developed for a nuclear plant in the 1990s needs to last to the 2140s. Hence, products supplied for the monitoring of facilities are required to last for decades, without becoming obsolete.

Temperature monitoring technologies

The reactors, spent fuel rods, dry stores and other facilities requiring temperature monitoring are usually monitored with thermocouple / RTD sensors wired to a remote monitoring system. This remote monitoring system accepts the signal from the temperature sensors, ensuring real-time temperature measurements are accurately taken so that any out-of-limit alarms are immediately triggered to alert the operators to act before such anomalies reach a critical stage.

This applies to any facility at a nuclear site. Remote monitoring technology can keep track of any temperature data and feed back into control rooms in real time – ensuring those facilities can stay ahead of any potentially dangerous situation.

The data can feed into alarm annunciators or SCADA (supervisory control and data acquisition) PC-based monitoring software, which can flag a potentially dangerously high temperature to the control room at the nuclear facility. Personnel can then act to address potentially abnormal conditions. In many instances the SCADA monitoring system also provides historical logging for post-event analysis and reporting.

For example, Omniflex's Maxiflex IO system has dedicated temperature modules which have been designed specifically for accurate temperature monitoring. Each input is fully isolated and can take data from any type of thermocouple or RTD. They have built-in CJC (cold junction compensation) and can generate rate of rise alarm profiles as well as providing four independent trip points. Each trip point can then generate a digital output which can be displayed on an alarm annunciator, or it could be networked via ethernet, CONET, or wirelessly back to the control room to be displayed on a SCADA system. This allows all temperature data to be logged in real time and historically, providing a bigger picture of the environment, which can help identify any potential underlying problems.

Omniflex's specialist remote temperature monitoring solutions have been used for reactors, fuel rods and other facilities within the nuclear sector, and are designed for all aspects of temperature monitoring. Its Alarm Annunciator product range has been through the Nuclear SIL process – EMPHASIS – where products are subject to stringent studies and tests as they are assessed according to the IEC 61508 Functional Safety Standard.

With advanced remote monitoring solutions, customers can ensure real-time data tracking and rapid response to critical temperature changes, safeguarding health, safety and operational efficiency.

Omniflex has been manufacturing remote monitoring and alarm annunciator systems since 1965 and all Omniflex products have a lifetime support policy. This means the company will continue to manufacture and support its products, no matter their age, for as long as they are still operational and in service.

For more information visit: www: www.omniflex.com

Data and sensing technology add value to PDS

Rapidly developing technology is constantly being harnessed by Proximity Detection Systems (PDS) to deliver steadily improving functionality for customers. Anton Lourens, CEO of Johannesburg-based PDS pioneer Booyco Electronics, says, "The world of electronic technology is an ever-evolving space with newer solutions being made available quicker than ever. In our experience, we see improved PDS solutions being developed, for instance, in the combination of multiple different sensing technologies into a single fully integrated solution."

This integrated sensing solution is then optimised through functional performance, driven mainly by software for these specific comprehensive PDS requirements," he adds.

As PDS technology evolves and matures, Lourens notes that the demand for processing power, and the ability to process multiple sensors, has increased dramatically since the first basic PDS units were developed.

"Fortunately, in our continuously evolving electronic world – including the global development of artificial intelligence (AI) solutions and big data mining – the PDS industry can access the required processing platforms," he says. "Similarly, sensing technology is expanding rapidly. This is introducing more suppliers of specific technology solutions, often making available different and better functions."

Lourens emphasises that PDS is playing an important part in mine automation. It is seen by some stakeholders as the foundation for autonomous vehicles, specifically with the enhancements around Level 9 engineering control solutions for trackless mobile machines (TMMs). In another important trend, various mining stakeholders and organisations are engaged in workstreams to define specific PDS requirements applicable to different operations.

"For instance, labour intensive operations have different requirements to automated operations," he says. "At the same time, we are experiencing more engagement from OEMs, who have an integral role in the overall proximity detection ecosystem. This is also driving their own standards and regulatory compliance."

In general, Booyco Electronics is seeing more collaboration from a spectrum of stakeholders to ensure improvements on safety standards – actively promoting the drive towards Zero Harm. As a leading player in PDS technology, the company remains committed to continuous improvement and meeting best practices that include integrated real-time data solutions for customers, Lourens says.

He highlights further: "In addition to the standard PDS functionality, the user gains significant benefits from using the data as a tool for change management. Beyond the ability to analyse traffic flow, for example, mines can identify high-risk areas and apply mitigating interventions.

"With the deployment of additional integrated technology, the value of the data can be further extended to include the measurement and improvement of operator behaviour, and that in turn could lead to productivity increases," he says.

Left: The integration of multiple sensing technologies into a single solution is a key development in delivering improved PDS functionality. Right: Booyco Electronics is committed to continuous improvement and meeting best practices that include real-time data solutions for customers.

Committed to full safety service

Dekra Industrial and its adult-based education and occupational skills training division, the Institute of Learning (IOL) are committed to providing holistic testing, inspection and training services across different industry sectors.

Managing Director Johan Gerber says, "Integrating non-destructive testing (NDT) inspections with adult-based education and occupational skills training, Dekra Industrial provides a comprehensive, value-driven solution to support its clients."

The company operates in key industrial centres around South Africa, including Sasolburg, Lephalale, Secunda, Middelburg and Cape Town.

Dekra Industrial and the IOL have aligned their services to ensure that where inspections and NDT services are provided, adult-based education and occupational skills training opportunities are also available.

"With this integrated approach, we position Dekra as a strategic partner to serve our clients. Our branch offices are located in key industrial regions so that we can offer an accessible and complete service to our clients," says Gerber.

Together, DEKRA Industrial and the IOL offer a portfolio of services that includes non-destructive testing (NDT) inspections, vendor inspections, vehicle mapping, welding inspections, safety consulting, and adult-based education and occupational-based skills training.

This service portfolio meets the needs of key sectors ranging from mining, power generation, and petrochemicals, to construction and manufacturing, assisting clients to meet stringent safety, compliance and quality standards. Dekra Industrial

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Floodlighting for safety in industrial applications

Leading lighting specialist BEKA Schréder is committed to improving safety, wellbeing, and sustainability with its extensive range of lighting solutions. These extend across various categories, from Ambiance, Road & Urban, and Illumination to Industry, Commercial, Floodlighting, and Smart & Connected systems. All BEKA Schréder's products are designed for efficiency and reliability. Sustainability is a core focus and new products include renewable energy solutions, such as solar-powered outdoor lighting.

The Floodlighting range is designed to meet diverse lighting requirements, offering high-performance solutions for industrial, commercial, and outdoor spaces. With advances in LED technology over the past few years, BEKA Schréder today can provide highly efficient and durable floodlights that deliver top-quality illumination and reduce energy consumption and maintenance costs. For sports arenas, large outdoor areas, or security lighting, its LED floodlights ensure optimal performance and reliability.

The OMNISTAR MICRO/MINI floodlight range is ideal for applications ranging from general area and perimeter lighting to mining, food and beverage, and industrial facilities.

One of the new developments in the company's portfolio is in solar-powered floodlighting. As the demand for sustainable and off-grid solutions grows, BEKA Schréder has developed and tested a solar highmast lighting system, demonstrating its efficiency and reliability in real-world applications. This innovation allows for powerful illumination in remote or infrastructure-limited areas, reducing dependency on traditional power sources and contributing to a greener future.

For enhanced functionality, many of the floodlights are available with optional control solutions. These smart control systems enable remote monitoring, adaptive lighting levels, and integration with existing infrastructure, ensuring maximum efficiency and operational savings. Options include dimming capabilities, motion sensors, or fully connected smart lighting networks, providing solutions that help optimise energy use while maintaining safety and visibility.

Embracing cutting-edge technology and sustainable practices, BEKA Schréder is committed to lighting the way toward a brighter, more energy-efficient future.

Continued from page 27

supports businesses in maintaining operational excellence, enhancing workforce skills and ensuring regulatory adherence.

Safety, compliance and industry expertise

Christopher Mörsner, Head of Training and Consulting at Dekra IOL, highlights: "By providing comprehensive training alongside NDT and inspections, we address our clients' immediate compliance needs – and contribute to the long-term sustainability of their businesses, ensuring the workforce has the knowledge and skills to maintain safety and regulatory requirements."

Dekra Industrial's holistic service approach extends to vendor inspections, ensuring that quality control measures are integrated across supply chains. In addition, the company now offers vehicle mapping services, in collaboration with Dekra in Japan. This involves mapping and collecting data on South African road conditions to test and improve advanced in-vehicle infotainment (IVI) systems. By gathering real-time data across various terrains, the initiative aims to enhance navigation and vehicle system performance, aligning with global automotive safety and efficiency standards. This further strengthens the company's role as a partner for diverse industries.

"Our goal is to build on our competitive advantage, refining our offerings and reinforcing Dekra's position as a holistic solutions provider," Gerber says. "We are placing strong emphasis on educating our teams internally to ensure every staff member understands the full scope of our services, so they can share this with clients who can benefit from it," he adds.

Mörsner comments: "Everything we do needs to be solution-based for our clients' benefit. Our clients are looking for streamlined, efficient services, combining global innovation where applicable, with local knowledge and experience. In this way we can add value to their business. Success is a collective effort," he says. "As a company, we succeed together with our clients."

DEKRA Industrial is now part of Dekra Global's Southern Europe, Middle East, and Africa (SEMEA) region. This shift from its former organisational positioning in the Asia-Pacific region strengthens its opportunities for growth, extending its services to markets such as Saudi Arabia, known for its oil, petrochemical and industrial operations.

Dekra Industrial offers its customers a holistic service, from non-destructive testing and inspection to industry training.

Engineering production lines to ensure product safety

The pressure on beverage manufacturers to produce their goods hygienically is increasing, consumer demands for product safety are growing and global standards issued by authorities such as the FDA (US Food & Drug Administration) are becoming stricter. As a result, machine and system components are also required to meet stricter demands. To enable machine builders and operators to achieve hygienic, low-maintenance and fail-safe production, igus has introduced a lubrication-free drylin linear and drive technology in hygienic design, including a design study for a ready-to-install SHT linear axis. This meets FDA and EU requirements, as well as the EHEDG guidelines regarding cleanability.

As regulations become stricter, companies in the beverage industry need to ensure that their equipment for filling, labelling, packaging and inspecting bottles and cans can be cleaned easily and thoroughly. This also applies to machine components such as linear technology, which is used for the adjustment and movement of filling heads, label dispensers and camera systems, among other things.

"The demand for linear technology in hygienic design is increasing rapidly. Machine manufacturers are looking for ways to further reduce the risk of contamination in their systems, and reduce the cleaning effort and thus operating costs, at the same time," says Michael Hornung, Product Manager drylin® Linear and Drive Technology at igus.

For this balancing act, igus offers a growing product portfolio which is being developed in accordance with the guidelines of the European Hygienic Engineering & Design Group (EHEDG). These require that components must either have a gap-free design or be encapsulated accordingly. "This way, we can support the safe and efficient operation of production facilities in the beverage industry," says Hornung.

SHT linear module for hygienic positioning tasks

Among its new products, igus recently showcased its design study of a ready-to-install SHT linear axis in hygienic design, which has been optimised for better rinsing. It is suitable for filling stations, for example, allowing for precise and hygienic movements to position bottles and cans. The axis uses stainless-steel round shafts as guidance and relies on dryspin lead screw technology from igus made of corrosion-free stainless steel for the drive. The truss assembly consists of two housing halves, sealed with an FDA-compliant silicone flat gasket and hygienic screws. Specially developed wiper seals protect the shafts and prevent dirt and moisture from entering the shaft end support. In addition, igus has designed the lead screw nut on the lead screw in such a way that there are generous gaps. This prevents deposits and makes it possible to clean them efficiently. Hornung says, "We are working on developing more products consistently in accordance with the hygienic design guidelines. We have also joined the EHEDG so we can facilitate new types of certification for open moving parts."

Lubrication-free drylin linear and drive technology from igus is designed according to the EHEDG guidelines.

A growing portfolio

Last year, igus presented the world's first sliding carriage for linear guides in hygienic design, which is made of 100% food-grade plastic with FDA and EU 10/2011 approval. Here, too, the design is completely open and free of dead space, making the system fully flushable – even using aggressive cleaning agents. The carriage is suitable for format adjustment in beverage-bottling plants, for example, to handle different bottle sizes without interchangeable parts. With solid lubricants integrated into the high-performance plastic, the carriage works hygienically with low-maintenance dry operation and does not require external lubrication.

Online learning for the renewable energy sector

A collaboration between industry, academia, and government, the online learning platform supports skills development for the renewable energy sector.

The launch of PowerUp, a South African first, introduces an online platform designed to equip the country's workforce with the skills required to meet industry demands. Developed as a key initiative under the South African Renewable Energy Masterplan (SAREM), PowerUp connects industry stakeholders with training institutions, facilitates the development of new qualifications, and addresses critical skills shortages.

It is a joint initiative spearheaded by leading industry stakeholders such as the Energy and Water Sector Education and Training Authority (EWSETA), GreenCape, SAPVIA, SAWEA, MerSETA, TIPS, QCTO, and others, with the United Kingdom Partnering for Accelerated Climate Transitions (UK PACT) Programme as the development funder. The platform enables collaboration between industry, academia, and government and aims to create pathways to employment in the renewable energy value chain. Its overall objective is to ensure that South Africa's renewable energy workforce is future ready.

Launched at an event hosted by EWSETA and GreenCape in March 2025, PowerUp was also highlighted at the Africa Energy Indaba's Energy and Investment Hub.

The British High Commissioner, Antony Phillipson, expressed his enthusiasm that UK PACT has contributed to the development of PowerUp and highlighted the platform as an important initiative to equip South Africa's renewable energy industry with the skills needed to push the industry forward. "By engaging key stakeholders, PowerUp will help ensure the availability of skills for job opportunities in the green industry sector, foster greater collaboration between academia and industry, and identify inclusive opportunities for youth and workers in transitioning regions."

Mpho Mookapele, CEO of EWSETA, highlighted the rapid expansion of South Africa's green economy and its role in driving a just transition, local capacity building, and inclusive economic participation. She said, "Success for PowerUp will be measured not only by the number of users on the system, but by the moment a TVET graduate completes their qualification and enters the job market equipped with relevant, in-demand skills that are made possible through the collaboration between PowerUp and industry."

She further emphasised that another key measure of success for the SETA would be the platform's impact across various industries. "We are striving to achieve the objectives of the NSDP (National Skills Development Plan) 2030, which aims to establish a credible mechanism to determine which skills are in demand in South Africa."

Deputy Minister of Electricity and Energy, Samantha Graham-Maré commended PowerUp as an exemplary model of public-private collaboration aimed at driving job creation and economic growth. "This innovative platform aligns with the collaborative ethos of the South African Renewable Energy Masterplan, which prioritises skills development as a key driver in unlocking the growth potential of the renewable energy sector."

Graham-Maré added that the success of SAREM (which has recently been approved by Cabinet) will depend on continuous collaboration and strong partnerships. "I am excited to see such a critical aspect of SAREM being addressed through PowerUp, and I encourage all stakeholders to actively participate and demonstrate our commitment to the future of South Africa's youth and the renewable energy sector," she said.

Mookapele urges industry leaders, Post-School Education and Training (PSET) institutions, SETAs, and key funders to drive the initiative forward actively and strategically. "Industry leaders play a pivotal role in shaping the workforce by identifying critical skills that are in demand and nurturing much-needed talent. PSET institutions can align curricula with industry needs while SETAs and funders unlock resources for impactful training. Together, we can build a skilled, future-ready workforce to drive South Africa's renewable energy sector." she said.

The PowerUp Steering Committee brings together representatives of:

- Council on Higher Education (CHE)
- Department of Higher Education and Training (DHET)
- Department of Mineral Resources and Energy (DMRE)
- Energy and Water Sector Education and Training Authority (EWSETA)
- GreenCape South Africa
- Manufacturing, Engineering and Related Services Sector Education and Training Authority (MerSETA)
- National Association of Automotive Component and Allied Manufacturers (NAACAM)
- Presidential Climate Commission (PCC)
- Quality Council for Trades and Occupations (QCTO)
- South African Photovoltaic Industry Association (SAPVIA)
- South African Wind Energy Association (SAWEA)
- Trade and Industrial Policy Strategies (TIPS)
- United Kingdom Partnering for Accelerated Climate Transitions (UK PACT)
- Yes4Youth

For more information visit: https://ewseta.org.za/power-up/

Wind energy is gaining momentum in SA

As South Africa progresses its energy transition, wind power is positioned to contribute significantly to the changing energy mix. With the country's power sector reforms and policy shifts, wind energy is recognised as integral to South Africa's energy future. Wangari Muchiri, Africa Director at the Global Wind Energy Council (GWEC) and Niveshen Govender, CEO of the South African Wind Energy Association (SAWEA) here reflect on 2024 and look to the possibilities for wind energy in South Africa's socio-economic development.

Wangari Muchiri, Africa Director at GWEC (right), and Niveshen Govender, CEO of SAWEA (left).

South Africa has made significant strides in transformative policy and regulatory developments. These are the result of collaborative efforts that have become a hallmark of the country's electricity sector in recent years.

Through policy advocacy and industry collaboration, the South African Wind Energy Association (SAWEA) has played a part in influencing legislative changes. Notable among these are the Electricity Regulation Amendment Act (ERAA) and the anticipated finalisation of the Integrated Resource Plan (IRP 2024).

These reforms lay the groundwork for a robust, investor-friendly wind energy sector that can generate employment, boost local manufacturing, and foster industrial growth. As momentum builds, this is the time to unlock the full potential of wind energy – to power homes and industries, and to drive economic growth, promote social equity, and support the country's long-term sustainability.

Sector reforms

Building on past successes, such as the launch of the first IRP in 2010 and the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) in 2011, strengthening policy and regulatory frameworks will unlock further investment in wind energy.

A major advance in South Africa's power sector reform was the passing of the Electricity Regulation Amendment Act. Signed into law in August 2024 and effective from January 2025, the ERAA opens the way to establish a competitive wholesale electricity market platform and an independent Transmission System Operator (TSO). This is expected to transform power production, trade, and grid operations and, at the same time, accelerate licensing and regulatory approvals and invite investment in grid expansion, key to developing and connecting wind farms.

Significant progress was also made through 2024 in the restructuring of Eskom, as envisaged in the 1998 Energy White Paper. The establishment of the National Transmission Company South Africa (NTCSA) marked an essential step forward in Eskom's transformation. The NTCSA will handle key functions of the TSO during the transition to a wholesale electricity market. Moreover, the introduction of Independent Transmission Projects (ITPs) is a positive move towards encouraging private sector participation in transmission development under the newly crafted Transmission Development Plan (TDP 2025–2037).

Advancing the energy mix

Wind energy continues to lead South Africa's transition to a low-carbon, renewable energy future. With over 3.5 GW of installed

capacity from 37 wind power plants, contributing over 46 480 GWh annually, wind energy plays an important role in the country's energy security.

Government is set to release the updated IRP 2024 in early 2025. According to modelling presented by the Department of Mineral Resources and Energy (DMRE), wind energy is slated to contribute between 69 and 76 GW of new capacity by 2050. This presents opportunities for investment, industrialisation, and job creation.

Renewable energy procurement

Since the inception of the REIPPPP in 2011, the programme has been pivotal in integrating renewable energy into South Africa's electricity mix. Alongside solar photovoltaic systems, the REIPPPP has contracted 3.5 GW of new generation capacity through 34 wind energy projects, strengthening energy security and advancing the just energy transition.

While challenges remain, such as transmission congestion, the REIPPPP has been a crucial policy initiative, facilitating private sector participation in the renewable energy market and reducing the country's reliance on fossil fuels.

The REIPPPP has attracted over R250 billion in investment, with a further 21 wind projects in the pipeline, representing 2.5 GW of additional capacity. The momentum is expected to continue, but it will be necessary to address structural challenges to restore market confidence.

In terms of South Africa's Just Energy Transition (JET) framework, the government aims to see another 6 GW of renewable energy capacity added to the grid between 2023 and 2027. Total investments in wind, solar, and energy storage are projected at R498 billion over the five-year period.

Advocacy in action

For over a decade, SAWEA has been a driving force behind the wind energy sector in South Africa. The annual Windaba Conference & Exhibition, hosted in Cape Town and endorsed by the Global Wind Energy Council (GWEC), continues to serve as a premier gathering for industry leaders, policymakers, and global experts. Under the patronage of South Africa's Minister of Electricity and Energy, Dr Kgosientsho Ramokgopa, Windaba offers a forum for discussions on sector developments, challenges, and opportunities.

In March 2025, SAWEA, alongside the GWEC, hosted a roundtable gathering for policy and industry leaders in South Africa, coinciding with the 17th Africa Energy Indaba in Cape Town. The event brought together policymakers and private sector stakeholders to explore the impact of unfolding policy-driven power sector reforms on the country's renewable energy market.

One factor that stood out from the engagement was that, as government continues to implement power sector reforms, it is important to align these with industry needs.

Repositioning the REIPPPP, ensuring grid availability and access, and rethinking funding instruments are central considerations as the industry continues to navigate the changing energy landscape.

Socio-economic impact

Beyond energy security, wind power is a catalyst for economic growth, industrial development, and job creation. Investments in wind energy stimulate domestic industries, with the establishment of local wind turbine manufacturing facilities fostering technological advances and reducing reliance on imports.

The South African Renewable Energy Masterplan (SAREM) outlines a strategic framework to drive industrialisation, expand employment, and localise manufacturing in the renewable energy sector. By focusing on technology transfer, skills development, and workforce training, South Africa can strengthen its wind energy industry to support the country's long-term sustainability.

The wind industry's social impact is evident, with over R898 million invested in socio-economic development initiatives by 2022. SAWEA's 2023 Community Engagement Handbook has further strengthened collaboration between developers and local communities, ensuring transparency and shared benefits from wind energy projects.

The potential for offshore wind

South Africa's wind resources, onshore and offshore, present significant opportunities for growth. To date, onshore wind farms dominate the wind energy sector but the potential for offshore wind is also substantial. A 2022 feasibility study by the CSIR estimated that South Africa could generate up to 44.52 TWh annually from shallow-water wind farms, and some 2 387.08 TWh from deep-water installations – equivalent to eight times the country's total electricity demand.

Offshore wind energy remains a long-term prospect but has attracted growing investor interest. For example, Hexicon AB, in partnership with Genesis Eco-Energy Developments, is planning an 800 MW offshore wind farm off the coast of Richards Bay, which will mark another significant milestone in South Africa's energy transition.

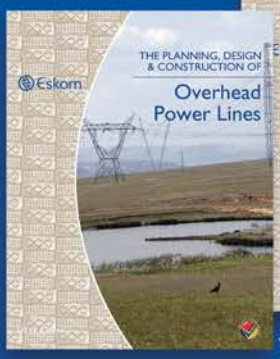
The road ahead

As South Africa enters its second decade of wind energy development, the progress made in 2024 serves as a clear indicator of the sector's transformative potential. Through continued policy advocacy, industry collaboration, and strategic investments, South Africa is poised to lead Africa's transition to a renewable energy future – driving economic growth, energy security, and sustainability.

For more information visit: https://sawea.org.za/

Eskom

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 acrued by Eskom over the years, as a guide and legacy and to serve as a source of reliable, reputable and highly technical information.



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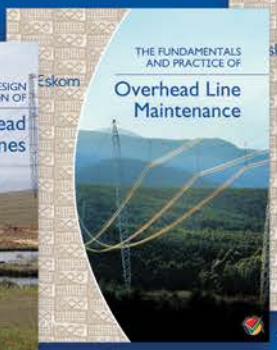

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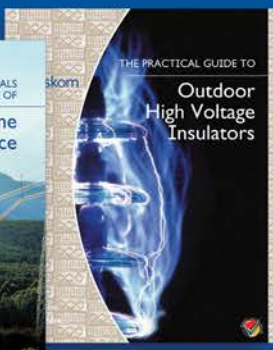

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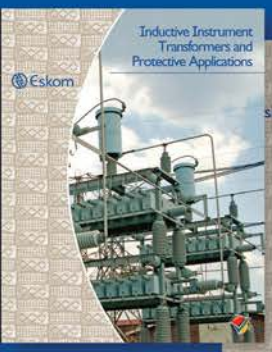

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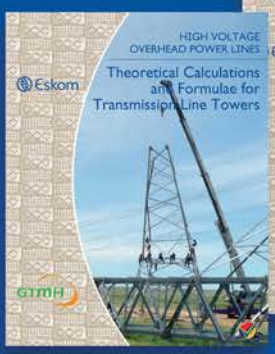

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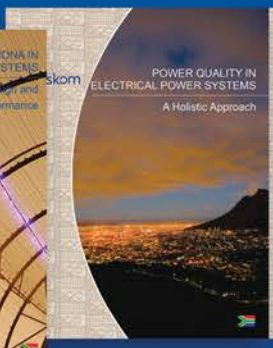

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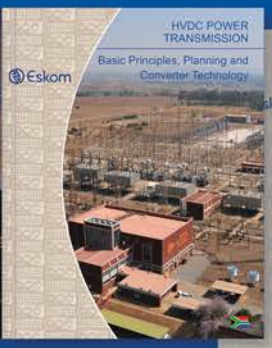

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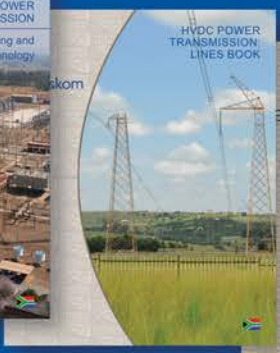

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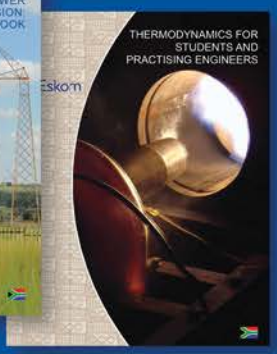

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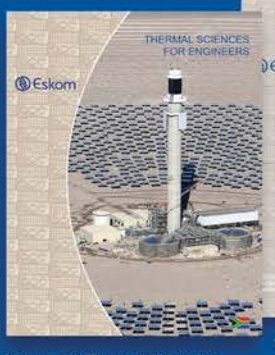

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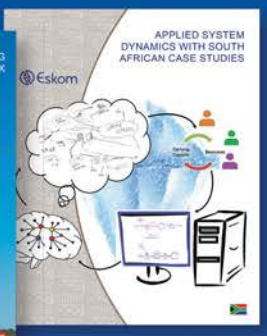

Volume 13: Applied System Dynamics with South African Case Studies

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.

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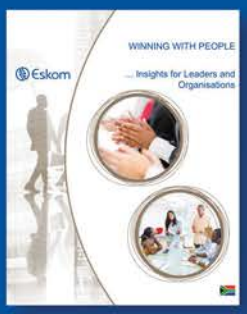

Volume 2: Winning with People ... Insights for Leaders and Organisations

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.

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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